





Marin County Flood Control and Water Conservation District

Corte Madera Creek Flood Risk Management Project, Phase 1

Draft Environmental Impact Report

February 2021

PANORAMA ENVIRONMENTAL, INC.

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Acronyms, Abbreviations, and Glossary

Acronyms and Abbreviations

µPa	micro-Pascals
AB	Assembly Bill
ABAG	Association for Bay Area Governments
ACC	Advanced Clean Cars
BAAQMD	Bay Area Air Quality Management District
Basin Plan	Water Quality Control Plan
Bay Area	San Francisco Bay Area
BMPs	best management practices
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalRecycle	California Department of Resources Recycling and Recovery
Cal OSHA	California Occupational Safety and Health Administration
CalEEMod	California Emissions Estimator Model®
CANAGPRA	California Native American Graves Protection and Repatriation Act
CARB	California Air Resources Board
CBC	California Building Code
CCAA	California Clean Air Act
CCC	Central California Coast
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife

CEC	California Energy Commission
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CGS	California Geological Survey
CH_4	methane
CIP	Capital Improvement Plan
CMCFCP	Corte Madera Creek Flood Control Project
CMP	Congestion Management Program
CNEL	Community Noise Equivalent Level
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO_2e	equivalent CO_2
COM	College of Marin
COPCs	contaminants of potential concern
CPUC	California Public Utilities Commission
CRPR	California Rare Plant Rank
CRS	Community Rating System
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
cy	cubic yard
dB	decibels
dBA	A-weighted sound levels
dbh	diameter at breast height
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control

EAP	Energy Action Plan
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ER	Engineering Regulation
ESCP	erosion and sediment control plan
ESLs	Environmental Screening Levels
ESU	Evolutionarily Significant Unit
EWOP	Existing Condition without Project
EWP	Existing Condition with Project
FDS	flood diversion and storage
FESA	Federal Endangered Species Act
FHWG	Fisheries Hydroacoustic Working Group
FIGR	Federated Indians of Graton Rancheria
FWOP	Future Condition without Project
FWP	Future Condition with Project
g	gravity
GASGEM	California Statewide Groundwater Elevation Monitoring
GHG	greenhouse gas
GWP	global warming potential
GPS	global positioning system
HCP	Habitat Conservation Plan
HFCs	hydrofluorocarbons
HMBP	Hazardous Materials Business Plan
HWMs	high water marks
Hz	Hertz

I-580	Interstate 580
in/sec	inches per second
IPCC	International Panel on Climate Change
IWMA	Integrated Waste Management Act
KFPD	Kentfield Fire Protection District
KOPs	key observation points
LCFS	Low Carbon Fuel Standard
L_{eq}	Equivalent Sound Level
LEV	Low-Emission Vehicle
L_{dn}	Day-Night Average Level
LID	low-impact development
L_{max}	Maximum Sound Level
L_{min}	Minimum Sound Level
LOS	Level of Service
MBTA	Migratory Bird Treaty Act
MCE	Maximum Credible Earthquake
MCSTOPPP	Marin County Stormwater Pollution Prevention Program
MMWD	Marin Municipal Water District
MPOs	Metropolitan Planning Organizations
MS4s	Small Municipal Separate Storm Sewer Systems
msl	mean sea level
MTC	Metropolitan Transportation Commission
$MTCO_2e$	metric tons of CO_2 equivalent
N_2O	nitrous oxide
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Plan

NFIP	National Flood Insurance Program
NGVD	National Geodetic Vertical Datum
NMFS	National Marine Fisheries Service
NOI	notice of intent
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NTDE	National Tidal Datum Epoch
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PBF	physical or biological features
PFCs	perfluorocarbons
PGA	peak ground acceleration
PG&E	Pacific Gas and Electric
PPV	peak particle velocity
PRDs	permit registration documents
Program	Ross Valley Watershed Flood Protection and Watershed Program
RCRA	Resource Conservation and Recovery Act
RVFD	Ross Valley Fire Department
RWQCB	Regional Water Quality Control Board
SAFZ	San Andreas Fault Zone
SARA	Superfund Amendments and Reauthorization Act
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
SEL	sound exposure levels
sf	square feet

SF_6	sulfur hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SFHA	Special Flood Hazard Areas
SIP	State Implementation Plan
SLC	seal level change
SMN	Science-Math-Nursing building
SMP	Stream Maintenance Program
SOD	Sudden Oak Death
SPF	standard project flood
SPL	sound pressure level
SRA	State Responsibility Area
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
The District	Marin County Flood Control and Water Conservation District
The project	Corte Madera Creek Flood Risk Management Project, Phase 1
TACs	toxic air contaminants
TCP	traditional cultural property
TMDL	Total maximum Daily Load
TMP	Traffic Management Plan
TSCA	Toxic Substances Control Act
TTLCs	Total Threshold Limit Concentrations
US 101	U.S. Highway 101
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey

VbD	vibration decibels
VHFHSZ	very high fire hazard severity zones
VMT	vehicle miles traveled
WDRs	Waste District Requirements
WSE	water surface elevation

Glossary

100-year flood event: A flood that statistically has a one-percent chance of occurring in any given year.

Aggradation: The act of raising the grade or level of a stream bed by depositing detritus, sediment, or the like.

Alluvial strata: Consists of unconsolidated mixtures of gravel, sand, clay, and silt typically deposited by streams.

Anadromous: Characterizes the life cycle of a fish that spawns in fresh water and spends a significant portion of its adult life in the ocean. Salmon and steelhead are anadromous.

A-weighted decibel (dBA): Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called "A-weighting," expressed as "dBA." The dBA, or A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies.

Backwater flooding: Upstream flooding caused by downstream conditions such as channel restriction and/or high flow in a downstream confluence stream.

Bankfull: The term bankfull refers to the water level stage that just begins to spill out of the channel into the floodplain.

Beneficial reuse: The use of byproducts or waste materials rather than discarding them.

Coarse sediment load: Particulate sediment, varying in size from sand to gravel, that is carried in the body of the flow.

Cofferdam: A watertight enclosure pumped dry to permit construction work below the waterline.

Dam inundation area: The specific areas of land that would become flooded and covered with water if a particular dam were to break or fail.

Emergent groundwater: Groundwater that emerges to the surface of the ground naturally, by an increase in infiltration from stormwater or other water source.

Floodplain: An area of low-lying ground adjacent to a river, formed mainly of river sediments and subject to flooding.

Floodwalls: A primarily vertical artificial barrier designed to temporarily contain the waters of a river or other waterway that may rise to unusual levels during seasonal or extreme weather events.

Groundwater basin: An area underlain by permeable materials capable of furnishing a significant supply of groundwater to wells or storing a significant amount of water.

Hydraulic capacity: The amount of water that can pass through a structure or watercourse.

Hydraulic constriction: A short reach of a creek where the cross-section is reduced.

Left bank: refers to the east or north side of the channel.

Level of service (LOS): A qualitative description of a facility's performance based on average delay per vehicle, vehicle density, or volume-to-capacity ratios. Levels of service range from LOS A, which indicates free-flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays.

Manning's 'n' factor: The Manning's 'n' is a coefficient which represents the roughness or friction applied to the flow by the channel.

Perennial safe yield: The amount of groundwater that can be withdrawn from a groundwater basin over a period of time without exceeding the long-term recharge of the basin or unreasonably affecting the basin's physical and chemical integrity.

Regulatory floodway: The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Right bank: Refers to the west or south side of the channel.

Riparian: The land adjacent to a natural watercourse such as a river or stream. Riparian areas support vegetation that provides important wildlife habitat as well as important fish habitat when sufficient to overhang the bank.

Scour protection: Rock, riprap, or similar materials added to edge of a waterway to protect the banks.

Sediment deposition: The process by which sediment, including soil and rocks, is deposited on the creek bottom due to a loss of kinetic energy in the water.

Sheetflow flooding: Floodwater flows that spread out over a large area at a uniform depth.

Special-status species: Several species known to occur within the general region of the program area are accorded "special status" because of their recognized rarity or vulnerability to habitat loss or population decline. Some of these species receive specific protection in federal and/or state endangered species legislation. Others have been designated as "sensitive species" or "species of special concern" on the basis of adopted policies of federal, state, or local resource agencies. These species are referred to collectively as "special-status species."

Streamflow gage: A tool to measure stream-water height and thereby measure the amount of water in the stream.

Threshold conveyance capacity: The flow a creek channel can contain before overtopping its banks.

Vegetated soil lift: A vegetated soil lift consists of soil encapsulated or wrapped in a facing element or fabric such as a rolled erosion control product, or a combination of erosion control products, that also act a reinforcing element.

Watershed: The region or area drained by a river, stream, etc.; drainage area.

Executive Summary

This executive summary is provided in accordance with Section 15123 of CEQA Guidelines. As stated in Section 15123(a) of CEQA Guidelines, "[a] EIR shall contain a brief summary of the proposed actions and its consequences. The language of the summary should be as clear and simple as reasonably practical." Section 15123(b) of CEQA Guidelines states, "[t]he summary shall identify: (1) Each significant effect with proposed mitigation measures and alternatives that would reduce or avoid that effect; (2) Areas of controversy known to the Lead Agency including issues raised by agencies and the public; and (3) Issues to be resolved including the choice among alternatives and whether or how to mitigate the significant effects." Accordingly, this summary includes a brief synopsis of the project and project alternatives, environmental impacts and mitigation measures, cumulative effects and mitigation measures, areas of known controversy, and issues to be resolved in the EIR. Table ES-1 presents the summary of potential environmental impacts, their level of significance before mitigation, mitigation measures, and levels of significance with mitigation.

ES.1 Summary of Project

The Marin County Flood Control and Water Conservation District (District) proposes the Corte Madera Creek Flood Risk Management Project, Phase 1 (project). The project objectives include the following:

1. **Flood-Risk Reduction.** Reduce overall flood inundation extent and depth in the Town of Ross and Kentfield areas.
2. **Environmental Benefits.** Improve fish passage, natural creek processes, and fish and riparian habitat adjacent to the creek.
3. **Public Access and Recreational Quality.** Maintain public access along the creek via the multi-use path and enhance the recreational experience and amenities along the creek corridor to meet Town of Ross and Kentfield area community needs.
4. **Operational Reliability.** Improve operational reliability and reduce long-term maintenance costs through improving channel stability and protecting existing utilities.
5. **Regulatory Compliance.** Comply with local, state, and federal environmental laws and regulations.
6. **Fiscally Responsible.** Implement a flood-risk reduction project that can be accomplished with local and reasonably foreseeable grant-funding opportunities.

As described in full in Chapter 2 Project Description, the project would be located within the Town of Ross and unincorporated Kentfield (see Figure ES-1). The larger Corte Madera Creek Flood Control Project was originally authorized under the Flood Control Act of 1944 and reauthorized in 1962. As originally planned, it consisted of six units with a concrete-lined channel extending approximately 6.5 miles from the San Pablo Bay upstream to the Town of Fairfax. It was designed to carry all the flow from a standard project flood (approximately 7,500 cubic feet per second [cfs] or a 0.4 percent annual exceedance probability event). Flood control improvements were completed in Units 1, 2, and 3 in 1968, 1969, and 1971, respectively. The Unit 1 and Unit 2 improvements consisted of an earthen trapezoidal channel, extending 3 miles from Kentfield to the San Pablo Bay. The upper 1,700 feet of Unit 2 was designed and constructed as a rectangular concrete-lined channel. Unit 3 extended the concrete-lined channel an additional 3,500 feet upstream, terminating 600 feet downstream of Lagunitas Road Bridge at the Denil fish ladder in the Town of Ross. Unit 4 was never constructed. The project would make improvements Units 2, 3, and 4 of the Corte Madera Creek channel. The project starts upstream of Lagunitas Road in the Town of Ross and ends downstream at the earthen channel in Kentfield. The District would implement this project to reduce flood risk by (i) increasing creek capacity to allow a greater volume of water to flow in channel; (ii) constructing or modifying flood protection elements, such as floodwalls and a stormwater pump station; and, (iii) enhancing creek habitat by removing portions of the concrete channel to create tidal, wetland, and riparian habitats and installing larger functional fish resting pools within the concrete channel. The proposed project elements are shown on Figure ES-2 through Figure ES-4.

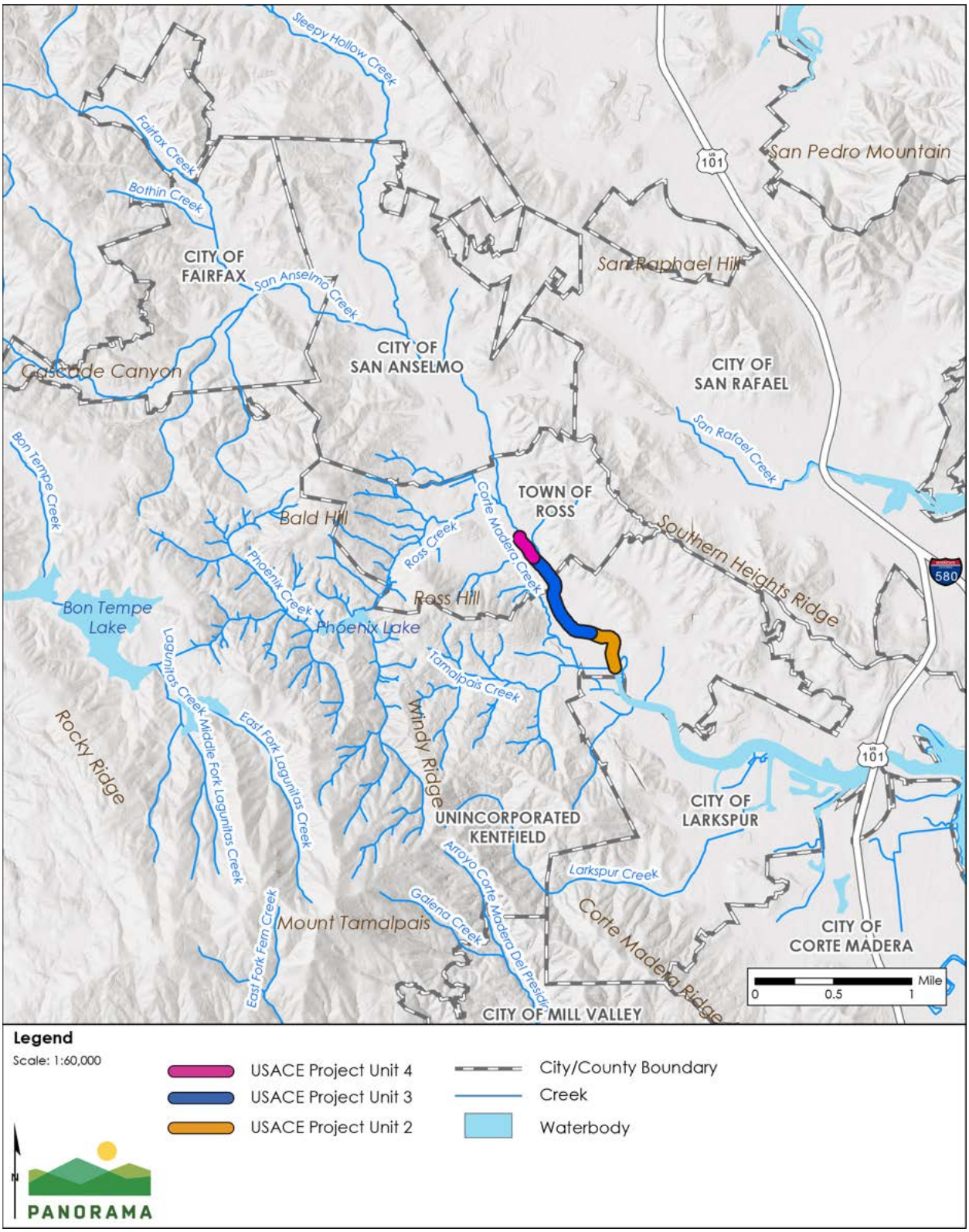
ES.2 Summary of Impacts and Mitigation Measures

Chapter 3 Environmental Setting, Impacts, and Mitigation Measures, describes in detail the environmental impacts that would result from implementation of the project. Impacts of the project may be classified as either:

1. **No impact**. No adverse effects would occur as a result of project implementation
2. **Less than significant**. Adverse effects would occur that are not substantial according to CEQA
3. **Less than significant with mitigation**. Significant or potentially significant adverse effects would occur, but feasible mitigation measures have been identified to reduce those impacts to less-than-significant level
4. **Significant and unavoidable**. Substantial or potentially substantial adverse changes in the environment would occur and the impacts cannot feasibly be reduced with mitigation measures to a less-than-significant level.

Table ES-1, at the end of this chapter, summarizes the project's environmental impacts (including cumulative impacts), the level of significance before mitigation, mitigation measures, and the level of significance after mitigation.

Figure ES-1 Project Location



Sources: (Tele Atlas North America, Inc., 2019; GHD, 2020h; USGS, 2019; U.S. Geological Survey, 2013)

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Figure ES-2 Project Elements (Map 1 of 3)



Source: (GHD, 2020a) (Stetson Engineers, Inc., 2020) (geomorphDESIGN, 2020b) (Tele Atlas North America, Inc., 2019) (Golden Gate National Parks Conservancy, 2018)

Figure ES-3 Project Elements (Map 2 of 3)



Source: (GHD, 2020a) (Stetson Engineers, Inc., 2020) (Tele Atlas North America, Inc., 2019) (Golden Gate National Parks Conservancy, 2018)

Figure ES-4 Project Elements (Map 3 of 3)



Source: (GHD, 2020a) (geomorphDESIGN, 2020) (Stetson Engineers, Inc., 2020) (Tele Atlas North America, Inc., 2020) (Golden Gate National Parks Conservancy, 2018)

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ES.3 Summary of Significant and Unavoidable, Growth-Inducing, and Cumulative Impacts

This section summarizes the significant and unavoidable adverse impacts, growth-inducing impacts, and cumulative impacts of the project.

ES.3.1 Significant and Unavoidable Impacts

Section 15126.2(b) of CEQA Guidelines requires that an EIR describe the significant impacts of a proposed project, including those that cannot be fully mitigated. This EIR finds that following significant and unavoidable impact would occur if they project were to be implemented.

Aesthetics and Visual Resources

Impact 3.1-2: Removal of the established trees in Frederick Allen Park would change the visual quality of the park. While the project includes landscaping of the park and tree planting within the park, the trees and vegetation that would be planted within the park would not have the same density and canopy as the existing well-established trees for a period of approximately 10 years after tree planting because it would take time for the trees and vegetation to grow and reestablish the dense tree canopy within the park. Views within Frederick Allen Park would change as a result of the tree removal and landscaping because the existing trees and vegetation along the fence visually screen the surrounding commercial buildings on the right bank and views of the concrete channel and residential areas on the left bank. Immediately following planting, the proposed concrete retaining wall, surrounding buildings and earthen channel would become more exposed, which would result in a substantial change in visual quality due to the increased exposure of concrete structures within the park setting. The District would implement Mitigation Measure 3.1-2, which requires integrating large box trees into the planting plan and design for Frederick Allen Park. While planting larger trees in the park would minimize impacts to visual quality immediately following construction, the large box trees would not be the same size and would not provide the same visual screening and cover as the fully grown trees that would be removed. The mitigation measure would not fully compensate for the trees being removed in the park. The impact to visual quality would remain significant and unavoidable. Impacts would become less than significant after approximately 10 years, when the landscaping matures and provides cover and visual screening for the park.

ES.3.2 Growth-Inducing Impacts

Chapter 4 Growth-Inducing and Cumulative Effects, discusses the growth-inducement potential of the project. It explains that the project would not involve any housing construction, road extension, permanent employment opportunities, or any infrastructure improvements that could directly or indirectly induce growth. The project would reduce flood risk in existing developed areas. Consequently, implementation of the project would not affect current and/or projected population growth patterns within Marin County and, therefore, would not have a growth-inducing impact.

ES.3.3 Cumulative Impacts

Chapter 4 Growth-Inducing and Cumulative Effects, of this EIR includes an analysis of cumulative impacts from the project. Cumulative impacts, as defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects that, when taken together, are "considerable" or that compound or increase other environmental impacts. Cumulative impacts were analyzed based on a list of past, present, and probable future projects producing related or cumulative impacts. These impacts were analyzed for whether they were "cumulatively considerable" (i.e., whether the incremental effects of this individual project are considerable when viewed in connection with the effects of past, current, and probable future projects, including those outside the control of the agency).

The cumulative impact analysis found that the project would not cause a new cumulative impact or make a considerable contribution to an existing cumulative impact. That determination was made in some cases because there is no cumulative impact to which the project could contribute. In other cases, the project's impacts, either on their own or after implementation of project-level mitigation measures, would not make a considerable contribution to a cumulative impact.

ES.4 Summary of Plan and Policy Consistency

This EIR evaluates whether the project would conflict with the Marin Countywide Plan, the Marin County Development Code (Zoning and Subdivision Regulations), or the Town of Ross General Plan in Section 3.16 Agriculture and Forestry Resources, Mineral Resources, Land Use and Planning, Population and Housing, Wildfire, and Socioeconomics. That analysis concludes that the project would not conflict with applicable policies and regulations. Appropriate decision makers in the District (the CEQA lead agency), Marin County, and the Town of Ross will review the project and make final determinations about the project's consistency with all applicable plans and policies.

ES.5 Summary of Alternatives to the Project

This EIR examines the following four alternatives to the project. The alternatives are summarized below and are described in detail in Chapter 5 Alternatives.

ES.5.1 No Project Alternative

Inclusion and evaluation of the No Project Alternative in an EIR is required by CEQA. This alternative would avoid the adverse environmental impacts of the project's construction and operation. In the No Project Alternative, there would be no construction actions taken or changes to the existing flood control channel or the District's current operations, maintenance, or management practices. The District would continue to maintain the Corte Madera Creek flood control channel and adjacent multi-use path and the Town of Ross would continue to maintain Frederick Allen Park as they do now. Because none of the flood risk reduction benefits and none of the habitat benefits of the project would occur under the No Project Alternative, the

existing flood risk in the area and the degraded ecological condition, including fish passage barriers, would persist.

ES.5.2 Alternative 1: Reduced Footprint – Avoid Frederick Allen Park

Alternative 1 would avoid construction in Frederick Allen Park, which would reduce the project footprint/area of disturbance. Under Alternative 1, four larger fish pools would be constructed within the existing concrete channel adjacent to Frederick Allen Park, but no other modifications would occur to the concrete channel and no construction would occur in the park. Alternative 1 includes construction of all proposed project elements within Unit 4, lower Unit 3, and Unit 2, including removal of the wooden fish ladder in Unit 4.

Compared to the proposed project, Alternative 1 would reduce short-term impacts on aesthetics, air quality, biological resources, geology and soils, GHG emission, hazardous materials, hydrology and water quality, noise, recreation, transportation and circulation, and utilities. Alternative 1 would avoid the significant and unavoidable impact on visual quality. Alternative 1 would result in less long-term benefits to aesthetics, biological resources, geology and soils, hydrology and water quality, and recreation than the proposed project. Alternative 1 would meet all feasibility criteria and would meet most project objectives.

ES.5.3 Alternative 2: Boardwalk in Frederick Allen Park

Alternative 2 would maintain the existing elevation for Bike Route 20 in Frederick Allen Park. The current bike path elevation would be maintained by constructing the multi-use path as a boardwalk, slightly elevated above the Frederick Allen Park floodplain area. No new public access to the creek would be included in Alternative 2. Alternative 2 would still include removal of the concrete channel and construction of a riparian floodplain within Frederick Allen Park. Alternative 2 includes construction of all proposed project elements within Unit 4, lower Unit 3, and Unit 2, including removal of the wooden fish ladder in Unit 4.

Compared to the proposed project, Alternative 2 would result in reduced operational impacts and increased long-term benefits on biological resources, hydrology and water quality, hazards, recreation, and transportation and circulation. Alternative 2 would meet all feasibility criteria and all project objectives.

ES.5.4 Alternative 3: Reduced Concrete and Increased Natural Materials

Alternative 3 would include constructing the retaining wall in Unit 4 and Frederick Allen Park using materials such as rocks or natural materials rather than concrete, and allowing vegetation plantings within the retaining walls; would replace the concrete transition structure at the connection between Units 3 and 4, with quarter- or half-ton rock instead of concrete; and, would include constructing the additional floodwall segment within lower Unit 2, using material such as rock or a soil-type barrier instead of concrete. The natural floodwall in Unit 2 would remain on the District's property but would be set back from the existing floodwall.

Compared to the proposed project, Alternative 3 would result in a slight reduction in long-term aesthetic, biological, and hydrology and water quality impacts than the proposed project. However, this alternative could result in slightly increased temporary air quality, GHG emissions, and energy impacts during construction due to increased import of materials. Alternative 3 would meet all feasibility criteria and all project objectives.

ES.6 Significant Irreversible Environmental Changes

Construction activities associated with the project would result in an irretrievable and irreversible commitment of natural resources though direct consumption of fossil fuels and use of materials. However, the energy consumption for construction would not result in substantial depletion of non-renewable energy resources and would not permanently increase reliance on energy resources that are not renewable. Construction activities would not reduce or interrupt existing electrical or natural gas services such that existing supplies would be constrained.

Project operations that would affect irretrievable resources would be limited to operation of the new stormwater pump station. Project maintenance would involve activities similar to maintenance of the existing flood control channel. Maintenance activities would result in irreversible and irretrievable use of energy and material resources from annual testing and emergency use of the stormwater pump station generator, use of electricity to power the stormwater pump station during storms, and use of diesel fuel and oil for maintenance vehicles and equipment. The commitment of non-renewable resources usage would be minor, and therefore, would not be significant.

The use of nonrenewable resources is expected to account for a minimal portion of the region's resources and would not affect the availability of these resources for other needs within the region.

ES.7 Areas of Known Controversy

The District held a web-based public scoping meeting on August 27, 2020, to solicit agency and public input regarding the project design and concept. Oral comments were received at the scoping meeting, and additional written comments were received at and following the meeting. The topics commented on – and thus the main areas of potential controversy are summarized in Table ES-1.

Table ES-1 Summary of Scoping Comments and Areas of Potential Controversy

Topic	Consideration
Aesthetics and Visual Resources	• Consider aesthetic impacts of tree removal on park setting
Air Quality	• Consider air quality impacts at Frederick Allen Park from tree removal. • Address air quality impacts during construction.

Topic	Consideration
Biological Resources	• Address impacts on sensitive species (including special-status plants, fish, and wildlife) and habitats. • Address impacts on fish and wildlife from the proposed creek access. • Address fish passage and fish pools improvement effects. • Address introduction of invasive species. • Address noise and vibration impacts on fish and birds. • Address impacts from tree removal and provide mitigation. • Discuss revegetation and restoration in the project area. • Provide plans for dewatering and fish rescue.
Cultural and Tribal Cultural Resources	• Obtain approval for the final disposition of archaeological, historical, and paleontological resources recovered on State lands.
Geology and Soils	• Address impacts from sediment erosion and aggradation in the Frederick Allen Park Riparian corridor. • Incorporate geological information from Marin Countywide Plan into the EIR. • Address impacts on the structural integrity of the existing concrete channel from the proposed fish pools.
Greenhous Gas Emissions	• Address impacts from greenhouse gas emissions during construction and operation and consider impacts from disposal of the concrete that will be removed in Unit 2.
Hazards and Hazardous Materials	• Address potential impacts from waste entering the creek from surrounding areas. • Discuss increasing risk to public safety from the floodwalls and retaining walls. • Address public safety risk at Frederick Allen Park and potential for people to come in contact with rapidly moving water.
Hydrology and Water Quality	• Address impacts from sediment erosion and accumulation, including increased risk of erosion from tree removal. • Address impacts from rising tidal influence and sea level rise. • Address impacts on flow, hydraulics, sediment transport, and sedimentation from new fish pools. • Address impacts from induced flooding in Frederick Allen Park. • Address impacts from overland water flow from Bolinas Avenue, Fernhill, Southwood, Norwood, Ames, and Lagunitas Road. • Address impacts on the flow through Frederick Allen Park. • Discuss flood risk on Kent Avenue. • Discuss accuracy of modeling and calculations. • Compare the 10-year and the 25-year flood risk reduction benefits under existing conditions and existing with cumulative projects. • Address impacts on water quality.
Noise	• Address noise impacts from the stormwater pump station. • Address noise impacts during construction.
Recreation	• Address impacts on bicycle route and use of the multi-use pathway. • Discuss impacts on informal pedestrian pathways.

Topic	Consideration
Transportation	• Address safety of bicyclists and pedestrians on realigned multi-use pathway. • Address impacts from construction truck trips. • Address impacts on bicycle and pedestrian access. • Address impacts on bike path.
Cumulative	• Address cumulative impacts from reasonably foreseeable future projects in the project vicinity. • Address flooding impacts in Granton Park from the access ramp.
Alternatives	• Consider an alternative that only removes the fish ladder • Consider an alternative with floodwall designs that would provide habitat value and would be appropriate for the seawalls on Corte Madera Creek. • Consider an alternative that does not include the project element in the Town of Ross. • Consider an alternative that requires less concrete removal and uses more natural materials. • Consider an alternative that minimizes the need and height of the floodwalls. • Consider an alternative that would eliminate or reduce potentially adverse impacts from sea level rise. • Consider an alternative for the area between Sir Francis Drake Blvd. and Lagunitas Bridge. • Consider an alternative for drainage under Kent Avenue. • Consider an alternative that would address flooding to residents of Sylvan Lane and Shady Lane.

A Scoping Summary Report containing the Notice of Preparation and scoping comments received are included in Appendix A. The Scoping Summary Report also identified the Draft EIR sections that address the scoping issues raised in the comments received.

ES.8 Major Conclusions and Issues to be Resolved

The following major conclusions and issues to be resolved are derived from the analysis in the EIR. The major conclusions of the EIR are presented first, followed by the issues to be resolved. The issues are presented to highlight the topics on which the decision-makers may want to focus special attention.

ES.8.1 Major EIR Conclusions

The EIR evaluates a total of 56 project-based potential adverse environmental impacts. Of these, 19 are identified as significant impacts. Feasible mitigation measures are available to reduce all but one of the project's significant project-based effects to a less-than-significant level. The one significant and unavoidable impact of the project is the temporary impact on visual quality within Frederick Allen Park. The impact on visual quality would be significant and unavoidable for a period of approximately 10 years while the planted trees grow to a height where the tree canopy screens views of the concrete structures and surrounding buildings to a level that is similar to the existing visual screening of the surrounding area. The EIR also evaluates

cumulative impacts of the project in combination with other related past, present, and probable future projects, and identifies one significant cumulative impact. The project's contribution to this impact would not be cumulatively considerable with implementation of mitigation.

The project would result in a substantial net reduction in flooding under existing and cumulative project conditions for the 10-year, 25-year and 100-year storm events within the Town of Ross and Kentfield area. The project would result in some increased flooding within parking areas adjacent to Corte Madera Creek near the College Avenue Bridge; however, the areas of increased flooding do not contain any homes or buildings and the increased flooding would not create a risk to life or property.

ES.8.2 Issues to be Resolved

Draft EIR Section 3.1 Aesthetics and Visual Resources, identified a significant and unavailable visual quality impact in Frederick Allen Park. Implementation of mitigation, which involves planting larger trees would not avoid the significant impact in Frederick Allen Park because the large trees would take approximately 10 years to mature and replace the tree canopy that is currently provided by the trees that would be removed in the park. The impact to visual quality would remain significant and unavoidable during the first 10 years of project operation. Impacts would be less than significant when the landscaping matures and provides shades, cover, and visual screening from the surrounding area.

The District's Board of Supervisors will need to consider whether to adopt a statement of overriding considerations, prior to approving the project, stating the reasons why the benefits of the project outweigh its significant and unavoidable impact as identified in this EIR and/or adopt feature of one or more of the alternatives that would further reduce this impact.

ES.8.3 Effects Found Not to be Significant

The impact analysis determined that in 10 of the 20 resource areas, impacts would be either less than significant or have no impact, generally due to the project's required compliance with applicable regulations protecting these resources and/or limited extent that the existing resource would be affected by the project. These resource areas are:

- Energy
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Public Services
- Utilities and Service Systems
- Agriculture and Forestry Resources
- Mineral Resources
- Land Use and Planning
- Population and Housing
- Wildfire

The EIR identified significant impacts that could be mitigated to a less-than-significant level with implementation of mitigation measures in the following resource areas:

- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hydrology and Water Quality
- Noise
- Recreation
- Transportation and Circulation
- Tribal Cultural Resources

ES.9 Other Social and Economic Impacts Found not to be Significant

CEQA Guidelines Section 15382 provides that "[a]n economic or social change by itself shall not be considered a significant effect on the environment." However, physical impacts associated with social or economic changes may be considered significant. Pursuant to CEQA Guidelines Section 15382, purely economic or social impacts would not be considered significant impacts of the project. This EIR evaluates all physical impacts that would result from the project and has not identified any physical impacts associated with substantial social or economic changes.

ES.10 Mitigation Monitoring and Reporting Program

In conformance with California Resources Code Section 21081.6, a Mitigation Monitoring and Reporting Program has been prepared for the project, if approved. The purpose of the program would be to ensure compliance with the mitigation measures incorporated into the project and set forth in this EIR. The Mitigation Monitoring and Reporting Program is presented in Appendix G.

Table ES-1 Summary of Impacts and Mitigation for the Project

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Aesthetics and Visual Resources			
Impact 3.1-1: The project would not have a substantial adverse effect on a scenic vista.	Less than Significant	None required.	Less than Significant
Impact 3.1-2: The project would not conflict with applicable zoning and other regulations governing scenic quality	Less than Significant	None required.	Less than Significant
Impact 3.1-3: The project would substantially degrade the existing visual character or quality of public views of the site and its surroundings	Potentially Significant	**Mitigation Measure 3.1-3: Large Tree Planting.** The District will integrate large box trees into the final planting plan and design for Frederick Allen Park to the extent feasible and ecologically appropriate for the proposed species. The final planting plan will be provided to the Town of Ross for review and comment no less than 90 days prior to landscaping.	Significant and Unavoidable
Air Quality			
Impact 3.2-1: The project would not conflict with or obstruct implementation of the applicable air quality plan.	Less than Significant	None required.	Less than Significant
Impact 3.2-2: The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard.	Potentially Significant	**Mitigation Measure 3.2-2: Fugitive Dust Measures.** To limit dust, criteria pollutants, and precursor emissions associated with construction, the following BAAQMD-recommended fugitive dust control measures shall be implemented and included in all contract specifications for components constructed under the project: • All exposed surfaces (e.g., unpaved parking areas, unpaved staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. • All haul trucks transporting soil, sand, or other loose material off site shall be covered. • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. • All vehicle speeds on unpaved roads shall be limited to 15 mph. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. • Construction equipment shall be properly maintained by a certified mechanic. • A publicly visible sign shall be posted with the telephone number and person to contact at the District regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.	Less than Significant
Impact 3.2-3: The project would not expose sensitive receptors to substantial pollutant concentrations.	Potentially Significant	**Mitigation Measure 3.2-3: Engine Controls for Construction Equipment.** All off-road equipment greater than 25 horsepower that operates for more than 20 total hours over the entire duration of construction activities shall have engines that meet the USEPA or CARB Tier 3 off-road and Diesel Particulate Filter level 3 emission standards or more stringent standards for all phases of construction except the Lower College of Marin concrete channel removal.	Less than Significant
Impact 3.2-4: The project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	Less than Significant	None required.	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Biological Resources			
Impact 3.3-1: The project would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	Potentially Significant	**Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities.** Prior to construction, the District shall have a qualified botanist conduct botanical surveys according to CDFW protocols (i.e., Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities [CDFW, 2018 or more current]) during the appropriate time(s) of year (i.e., surveys shall coincide with the phenological stage during which the potential special-status plant species are identifiable in the field—for example, in April and again in July) to determine if any potential special-status plant species or sensitive natural communities are located within or immediately adjacent to the project area. If construction is planned to begin prior to the completion of comprehensive botanical surveys (e.g., construction is planned for April 2022, but plant surveys are planned for April and July), then the District shall conduct comprehensive plant surveys the year prior to construction (e.g., in 2021). If no special-status plants or sensitive natural communities are observed during appropriately timed surveys by a qualified botanist, it is assumed the construction activity will have no impact on special-status plants or sensitive natural communities and no further action is required. Immediately preceding construction, the District shall flag or otherwise mark (e.g., stake, fence) areas with special-status plants or sensitive natural communities within the project area for avoidance, including a 10-foot radius buffer. The District also shall identify locations for equipment and personnel-access and materials staging that will minimize disturbance in riparian habitat and coastal brackish marsh. When heavy equipment is required, unintentional soil compaction shall be minimized by using equipment with a greater reach or using low-pressure equipment. A biological monitor shall be present during construction within a 10-foot buffer of special-status plants to ensure impacts are avoided. If avoidance of any special-status plant is not possible, prior to construction the District shall coordinate with CDFW and/or USFWS to establish procedures for compensatory mitigation. These measures may include collection of seeds when mature (generally the beginning of plant senescence) and salvage and transplant of any special-status plants that would otherwise be impacted by construction activities. Mitigation ratios, location, and timing of transplants shall be determined in consultation with CDFW and/or USFWS, and the mitigation ratio will be at a minimum of 1:1. The District shall monitor the success of transplant establishment for a period of at least three years, or as otherwise required by CDFW and/or USFWS. Location of transplanted individuals shall be recorded using a submeter-accuracy global positioning system (GPS) to enable location of the special-status plant species during and after the monitoring period is complete. **Mitigation Measure 3.3-1b: Fish Capture and Relocation.** If in-channel work requires dewatering, including for sediment-removal maintenance activities, fish shall be captured and relocated upstream of the project areas to avoid injury and mortality and minimize disturbance. The District shall implement the measures below and described in the fish rescue plans in Appendix D, or whatever more stringent species-preservation and avoidance measures are imposed by resource agencies, including NMFS and CDFW, with jurisdiction over aquatic special-status species. 1. The name(s) and credentials of qualified biologist(s) to act as construction monitors shall be submitted to CDFW and NMFS for approval at least 15 days before construction work begins. 2. Prior to and during the initiation of construction activities, a qualified fisheries biologist (i.e., approved by CDFW and/or NMFS) shall be present during installation and removal of creek-diversion structures. 3. For sites that require flow diversion and exclusion, the work area shall be blocked by placing fine-meshed nets or screens above and below the work area to prevent salmonids from re-entering the work area. To minimize the potential for re-entry, mesh diameter shall not exceed 1/8 inch. The bottom edge of the net or screen shall be secured to the channel bed to prevent fish from passing under the screen. Exclusion screening shall be placed in low-velocity areas to minimize fish impingement against the mesh. Screens shall be checked periodically and cleaned of debris to permit free flow of water. 4. Before removal and relocation on individual fish begins, a qualified fisheries biologist shall identify the most appropriate release location(s). In general, release locations should have water temperatures similar to (<3.6 degrees Fahrenheit difference) the capture location and offer ample habitat (e.g., depth, velocity, cover, connectivity) for	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation

released fish and should be selected to minimize the likelihood of reentering the work area or becoming impinged on exclusion nets or screens.

5. The means of capture shall depend on the nature of the work site and shall be selected by a qualified fisheries biologist as authorized by CDFW and NMFS. Complex stream habitat may require the use of electrofishing equipment, whereas in outlet pools, fish and other aquatic species may be captured by pumping down the pool and then seining or dip netting. Electrofishing, if necessary, shall be conducted only by properly trained personnel holding current permits from CDFW and NMFS and following the most recent NMFS electrofishing guidelines (NMFS, 2000).
6. Initial fish relocation efforts shall be performed several days prior to the scheduled start of construction and continue through cofferdam installation and work-area dewatering activities.
7. Flow diversions and species relocation shall be performed during morning periods. The fisheries biologist shall survey the exclusion screening throughout the diversion effort to verify that no special-status fish, amphibians, or aquatic invertebrates are present. Handling of fish shall be minimized. When handling is necessary, personnel shall wet hands or nets before touching them.
8. Prior to translocation, fish that are collected during surveys shall be temporarily held in cool, aerated, shaded water using a five-gallon container with a lid. Overcrowding in containers shall be avoided; at least two containers shall be used, and no more than 25 fish shall be kept in each bucket. Aeration shall be provided with a battery-powered external bubbler. Fish shall be protected from jostling and noise and shall not be removed from the container until the time of release. A thermometer shall be placed in each holding container, and cold blocks or partial water changes shall be conducted as necessary to maintain a stable water temperature. Special-status fish shall not be held more than 30 minutes.
9. If fish are abundant, capture shall cease periodically to allow release and minimize the time fish spend in holding containers.
10. Fish shall not be anesthetized or measured. However, they shall be visually identified to species level, and year classes shall be estimated and recorded.
11. Reports on fish-relocation activities shall be submitted to CDFW and NMFS in within two weeks following completion of in-channel operations.

Mitigation Measure 3.3-1c: Environmental Awareness Training and Site Protection. All construction personnel shall attend an environmental education program delivered by a qualified biologist prior to working in the project area. The training shall include an explanation as how to best avoid the accidental take of special-status species, including salmonids and other fish species, amphibians, reptiles, birds, and rare plants.

The training session shall be mandatory for contractors and all construction personnel. The field meeting shall include topics on species identification, life history, descriptions, and habitat requirements during various life stages. Emphasis shall be placed on the importance of the habitat and life-stage requirements within the context of maps showing areas where minimization and avoidance measures are being implemented. The program shall include an explanation of appropriate federal and state laws protecting endangered species and all mitigation measures that will be implemented to avoid significant impacts on special-status species. Each person will receive a training handout for their use and reference.

The contractor shall provide closed garbage containers for the disposal of all trash items (e.g., wrappers, cans, bottles, food scraps). Work sites shall be cleaned of litter before closure each day and litter placed in wildlife-proof garbage receptacles. Construction personnel shall not feed or otherwise attract any wildlife. No pets, excluding service animals, shall be allowed in construction areas.

Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds. If tree removal occurs outside of the nesting season, no surveys or monitoring would be needed. If tree removal or construction occurs in the nesting season (February 1 to August 31). If tree removal or construction occurs in the nesting season (February 1 to August 31), a qualified biologist shall conduct a white-tailed kite and general nesting bird survey within the project area and areas within a 500-foot buffer from project construction. If active nests are identified, a no-disturbance buffer zone will be established around the nest as appropriate and in consideration of line-of-sight for the bird as well as existing human presence/activities

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation

around the nest when it was established; recommended buffers are 500 feet for white-tailed kite and non-listed raptors, and 25 feet to 250 feet for other non-listed birds as recommended by a biologist who is qualified to assess avian breeding behavior. Smaller buffers may be appropriate in the project area given the limited line of site due to existing development and anthropogenic disturbance in the area (e.g., traffic on Sir Francis Drake and adjoining areas). Construction work may continue outside of the no-work buffer.

Mitigation Measure 3.3-1e: Invasive Plant Species Control. All vehicles and equipment entering the project shall be washed to remove dirt, pathogens, invasive plant seeds, or invasive plant parts prior to entry on the project site. Particular attention shall be shown to the undercarriage and any surface where soil containing invasive plant seeds may exist. The District shall dispose of the waste material in an appropriate disposal facility. Arrangements shall be made for inspection of each piece of equipment before entering the project construction areas to ensure all equipment has been properly washed. The District shall follow these additional measures:

- Any permanent or temporary erosion control measures implemented to minimize erosion during and after construction shall be certified weed-free.
- Nursery operations that supply revegetation or seeding plant material must certify implementation of best management practices to reduce pest and pathogen contamination within their nursery, including of Phytophthora pathogens, the pathogen responsible for Sudden Oak Death (SOD).
- All tree removal and trimming activities shall include measures to avoid the spread of SOD (Phytophthora) pathogens. This may include, but is not limited to the following:
  - As a precaution against spreading the pathogen, pruning tools shall be cleaned and disinfected after use on confirmed or suspected infested trees or in known infested areas. Tools shall be sanitized before pruning healthy trees or working in pathogen-free areas. Chippers and other vehicles of mud, dirt, leaves, organic material, and woody debris shall be cleaned before leaving a site known to have SOD and before entering a site with susceptible hosts.
  - Crews shall be informed about the arboricultural implications of SOD and sanitation practices when they are working in infested areas.
  - Sanitation kits containing chlorine bleach, scrub brush, metal scraper, boot brush, and plastic gloves shall be provided to crews.
  - Shoes, pruning gear, and other equipment shall be sanitized before working in an area with susceptible species.
  - When possible, the District shall conduct work on SOD-infected and susceptible species during the dry season (June through October). When working in wet conditions, equipment shall be kept on paved, graveled, or dry surfaces and mud avoided. The District shall work in disease-free areas before proceeding to any infested areas.
  - If possible, soil or plant material (wood, brush, leaves, and litter) from host trees in any infested areas shall not be collected. Rather, material (e.g., wood, bark, brush, chips, leaves, or firewood) from tree removals or pruning of symptomatic or non-symptomatic host plants shall remain on site to minimize pathogen spread.
  - All reasonable methods to sanitize personal gear and crew equipment shall be used before leaving an SOD infested site. Accumulated soil and mud shall be scraped, brushed, and/or hosed off from clothing, gloves, boots, and shoes. Mud and plant debris shall be removed by blowing out or power washing chipper trucks, chippers, bucket trucks, fertilization and soil aeration equipment, cranes, and other vehicles. Movement of soil and leaf litter shall be restricted under and around infected trees as spores may be found there.
  - Tools used in tree removal/pruning may become contaminated and shall be disinfected with alcohol or chlorine bleach.

Mitigation Measure 3.3-1f: Intertidal Upstream of Stadium Way Cofferdam. Prior to completing construction of the cofferdam near Stadium Way for the Unit 2 dewatering, an inspection of the reach upstream will be conducted to determine if tidal water is present at low tide. A fish removal/herding effort will be initiated if tidal water is present. The fish removal/herding effort will consist of a beach seine sweep beginning at the upstream end of tidal water and proceeding in a downstream direction to the Stadium Way cofferdam site. The impoundment structure could be completed once the sweeping action is downstream of the cofferdam. This action would ensure that estuarine fish would

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		not be stranded in standing water upstream of the Stadium Way cofferdam and be subject to injury or mortality during the approximately eight weeks this reach would be cut off from tidal flux. **Mitigation Measure 3.3-1g: Avoid Salt Marsh Harvest Mouse.** Prior to initiation of project work in potential salt marsh harvest mouse habitat, the areas and pathways to be affected will be flagged by construction personnel and verified by a Qualified Biological Monitor (including work areas, staging areas, and access roads/paths to these work and staging areas). The flagged areas(s) will include a two-foot perimeter buffer. All wetland vegetation and other vegetation within 50 feet of wetland vegetation requiring removal will be removed under the supervision of the USFWS- and CDFW-approved Qualified Biological Monitor. This vegetation will be salvaged and maintained on site and will be replanted upon completion of construction activities. Vegetation removal shall start at the edge farthest from the salt marsh or the poorest habitat and work its way towards the salt marsh or the better salt marsh habitat. If a mouse of any species is observed within the areas being removed of vegetation, work shall be halted and the USFWS and CDFW shall be notified. To prevent salt marsh harvest mice from moving through the project site during construction, temporary exclusion fencing will be placed around defined work area(s) identified by the Qualified Biological Monitor prior to the start of construction activities. The fencing will be installed immediately after vegetation removal, with the two-foot buffer (cleared of vegetation) remaining between fencing and existing vegetation. The fence will consist of silt fencing (or similar material) and will be buried to a minimum depth of two inches so that mice cannot crawl under the fence. Fence height will be at least one foot higher than the highest adjacent vegetation, with a minimum height of two feet. All supports for the exclusion fencing will be placed on the inside of the work area. The fencing will be immediately removed upon project completion. Prior to the start of daily construction activities, the Qualified Biological Monitor will inspect the exclusion fencing to ensure that it is functional (e.g., has no rips or tears and remains buried in the ground). The fenced area(s) will also be inspected to ensure that no mice are trapped there. Any mice suspected to be salt marsh harvest mice that are found along and outside the fence will be closely monitored until they move away from the construction area. To prevent potential entrapment of salt marsh harvest mice in work equipment, pipes or similar objects located in salt marsh harvest mouse habitat will be capped prior to the end of the workday and then inspected by the biological monitor prior to commencement of work activities the following day. Work in or immediately adjacent to vegetated marsh areas, as identified by the Qualified Biological Monitor, will be scheduled to avoid extreme high tides because protective cover for mice is limited at this time. Specifically, no work will occur two hours before or after extreme high tides as directed by the Qualified Biological Monitor for 6.0 feet National Geodetic Vertical Datum (NGVD) or above, as measured at the Golden Gate Bridge, or adjusted to the timing of local extreme high-tide events in which the marsh plain is flooded.	
Impact 3.3-2: The project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	Potentially Significant	**Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities (see above)** **Mitigation Measure 3.3-1e: Invasive Plant Species Control (see above)** **Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan.** The District shall prepare a Habitat Restoration and Monitoring Plan for revegetation prior to construction activities as detailed herein. The plan shall describe any required salvage and replanting protocols prior to and after construction is complete. The plan shall include, but not be limited to, protocols for replanting of vegetation removed prior to or during construction and management and monitoring of the plants to ensure replanting success pursuant to the most stringent requirements included in permits issued for the project. At a minimum, impacted trees greater than or equal to six inches diameter at breast height (dbh) shall be mitigated at a minimum of 1:1 replacement for nonnative tree species and 3:1 replacement for native tree species. Monitoring and any necessary maintenance of revegetated areas shall occur for a minimum of ten years. The plan shall specify monitoring and performance criteria for the species planted and invasive species control criteria as well as the best time of year for planting and seeding to occur, pursuant to requirements of permits from the various resource agencies with regulatory purview over the project. At a minimum, replanted woody trees and shrubs shall have a minimum of 85% survival after five years of monitoring to track progress toward performance criteria. Additional	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		monitoring shall be conducted if the revegetated areas do not meet the performance criteria in year five; any replacement plants shall be monitored with the same survival criteria for five years after planting. Areas impacted by construction-related activity shall be replanted or reseeded with native trees, shrubs, and herbaceous perennials and annuals from the watershed under guidance from a qualified biologist. Local plant materials shall be used for revegetation of the disturbed area. The plant materials shall include local cuttings from the local watershed or from adjacent watersheds. Seeds shall be collected during the appropriate season, and the container plants shall be of an appropriate size for out-planting. The Habitat Restoration and Monitoring Plan shall also address restoration of jurisdictional wetlands and waters. Temporary impacts to wetlands shall be restored on site with native wetland species under guidance from a qualified biologist. Permanent impacts to jurisdictional wetlands shall be mitigated for by replacement on or off site at a minimum 1:1 ratio or whatever more stringent requirements are included in the permits to be issued for the project. The monitoring plan shall include annual monitoring of restored areas for at least five years. The plan shall contain vegetation management protocols, protocols for monitoring replanting success, and an adaptive management plan if success criteria are not being met. The adaptive management plan would include interim thresholds for replanting success and alternative management approaches, such as weed control, supplemental watering, or additional replanting to undertake if thresholds are not met. **Mitigation Measure 3.3-2b: Tree Mitigation.** To mitigate for removal of any native trees in the project area or any trees greater than or equal to 6 inches located within the riparian corridor, the District shall replant trees on site, to the extent possible. The District will identify other suitable locations within the watershed if the project area is not large enough to support the replacement of all trees required for mitigation. If suitable mitigation sites are not located within the watershed, then additional sites will be identified within the County or beyond. All mitigation sites shall be coordinated with and approved by resource agencies. The District may contribute funds to the Oak Woodlands Conservation Fund, as established under subdivision (a) of Section 1363 of the Fish and Game Code to the extent allowed by CDFW. Mitigation ratios shall be developed in coordination with the relevant resource agencies (i.e., CDFW and RWQCB) and the Town of Ross and shall vary according to both the type of tree impacted (i.e., tree species, whether or not the impacted tree is native to California or nonnative, and tree size) and the location of the mitigation planting (i.e., trees planted outside of the watershed may be subject to higher mitigation ratios). Impact mitigation ratios shall be a minimum of 1:1 for nonnative tree species to 3:1 for most native tree species or on a trunk-diameter basis per the Town of Ross Municipal code (i.e., 1:1 trunk diameter for trees in good or excellent condition [e.g., one 21-inch tree removed in good condition shall be replaced by new trees totaling 21-inch trunk diameter], 3:1 trunk diameter for trees in fair or marginal condition [e.g., one 21-inch tree removed in fair condition shall be replaced by new trees totaling 7-inch trunk diameter], and trees in poor condition shall be replaced with tree[s] totaling two inches in truck diameter), whichever is greater. Impact mitigation ratios for oak trees are expected to range from 4:1 (for impacted oak trees that are 5 to 10 inches dbh) to 5:1 (for impacted oak trees that are 10 to 15 inches dbh) and 15:1 (for impacted oak trees greater than 15 inches dbh). The District shall prepare a detailed Tree Mitigation Plan and obtain approval from CDFW for the Tree Mitigation Plan. Replacement oaks shall come from nursery stock grown from locally sourced acorns or from acorns gathered locally, preferably from the same watershed in which they are planted. The trees should be able to survive the last two years of the minimum five-year monitoring period without supplemental irrigation. If at any time the District identifies additional trees that need to be removed, the District shall first get written approval from CDFW, RWQCB, and the Town of Ross and the District shall revise the final plan to include additional tree plantings in accordance with agency-approved mitigation ratios. Based on final total of trees impacted by the project, the plan shall include the details of the number and species of trees to be planted, specific planting locations, maintenance and irrigation needs, monitoring requirements (i.e., five years monitoring plant vigor and growth), reporting requirements, and success criteria to be met before monitoring is concluded (e.g., survival rates, assessment of “good” overall tree vigor, and tree viability without irrigation). The plan shall be submitted to resource agencies for review and approval prior to implementation.	
Impact 3.3-3: The project would not have a substantial adverse effect on state or federally protected wetlands	Potentially Significant	**Mitigation Measure 3.3-1e: Invasive Plant Species Control (see above)**	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
(including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means.			
Impact 3.3-4: The project would not 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.	Potentially Significant	**Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds and Mitigation Measure 3.3-2b: Tree Mitigation (see above)**	Less than Significant
Impact 3.3-5: The project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	Less than Significant	None required.	Less than Significant
Impact 3.3-6: The project would not introduce a new non-native or invasive species of plant or animal into an area.	Potentially Significant	**Mitigation Measure 3.3-6: Invasive Aquatic Species Control.** All heavy equipment that has operated in waters outside of the Corte Madera Creek watershed shall be steam-cleaned and inspected prior to entering the project area. Any in-channel equipment that could be used in other water bodies will be decontaminated following the completion of the project. In addition, all waders, wading boots, block nets, dip nets, and buckets used within Corte Madera Creek will undergo decontamination. Decontamination protocols will include: • Freeze equipment/gear for a minimum of 8 hours at temperatures at 26°F (-3°C) or below. • Soak equipment/gear in a bath of hot water (at least 120°F, 46°C) for 10 minutes. • Soak equipment/gear in a bath of a disinfectant containing quaternary ammonium compounds (QAC) (e.g., Quat 4, Quat 128, Super HDQ Neutral, etc.) for 10 minutes. The QAC-containing disinfectant should be diluted with water at a rate to achieve a minimum active QAC concentration of 0.4%. Six (6) ounces of disinfectant to gallon of water can be used as a disinfectant to water ratio (1:21). After removal from the bath, rinse equipment/gear thoroughly with tap water.	Less than Significant
Cultural Resources			
Impact 3.4-1: The project would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.	No Impact	None required.	No Impact
Impact 3.4-2: The project could cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.	Potentially Significant	**Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources.** If evidence of any subsurface archaeological features or deposits are discovered during construction-related earth-moving activities, all ground-disturbing activity in the area of the discovery shall be halted within 50 feet of the find, and the finds shall be protected until they are examined by a qualified archaeologist. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; stone-milling equipment (e.g., mortars, pestles, handstones, milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include building or structure footings and walls and deposits of metal, glass, and/or ceramic refuse. The District shall retain a qualified archaeologist who meets the U.S. Secretary of the Interiors professional qualifications in archaeology to assess the significance of the find and make recommendations for further evaluation and treatment as necessary. A Native American representative from a traditionally and culturally affiliated tribe will be notified and invited to assess the find if the artifacts are of Native American ancestry and determined to be more than an isolated find. If the discovery is in an area below Stadium Way and on lands under the jurisdiction of California State Lands Commission, that agency shall be notified. Any treatments and disposition of any artifacts uncovered under the jurisdiction of the California State Lands Commission must be approved by the California State Lands Commission before the treatment is implemented.	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		If, after evaluation, a resource is considered a historical resource or unique archaeological resource (as defined in CEQA Guidelines Section 15064.5), or a tribal cultural resource (as defined in PRC Section 21074), all preservation options shall be considered as required by CEQA (see CEQA Guidelines Section 15126.4 and PRC 21084.3), including possible capping, data recovery, mapping, or avoidance of the resource. Treatment that preserves or restores the cultural character and integrity of a tribal cultural resource may include tribal monitoring, culturally appropriate recovery of cultural objects, and reburial of cultural objects or cultural soil. Work in the area may resume, at the direction of the District, upon completion of treatment. The results of the identification, evaluation, and/or data recovery program for any unanticipated discoveries shall be presented in a professional-quality report that details all methods and findings, evaluates the nature and significance of the resources, analyzes and interprets the results, and distributes this information to the public.	
Impact 3.4-3: The project could disturb any human remains, including those interred outside of formal cemeteries.	Less than Significant	None required.	Less than Significant
Energy			
Impact 3.5-1: The project would not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation.	Less than Significant	None required.	Less than Significant
Impact 3.5-2: The project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	Less than Significant	None required.	Less than Significant
Geology and Soils			
Impact 3.6-1: The project could directly or indirectly cause potential substantial adverse effects, including the risk or loss, injury, or death involving: i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. Refer to Division of Mines and Geology Special Publication 42. ii. Strong seismic ground shaking. iii. Seismic-related ground failure, including liquefaction. iv. Landslides.	Potentially Significant	**Mitigation Measure 3.6-1: Geotechnical Investigation Report** The District shall have a professional geotechnical engineer conduct a geotechnical investigation to evaluate the potential for geotechnical hazards to occur on-site in accordance with the recommendations of the California Geological Survey. The Geotechnical Investigation Report shall provide site-specific recommendations for structures (e.g., floodwalls, fish pools, and stormwater pump station), work areas, and access routes where there is an elevated risk of geologic hazards. The Geotechnical Investigation Report shall be incorporated into the final project design of the retaining walls and floodwalls. The Geotechnical Investigation Report shall specify exact design coefficients that are needed by structural engineers to determine the type and sizing of structural materials. The Geotechnical Investigation Report shall be subject to performance criteria imposed by the California Building Code, as applicable. The Geotechnical Investigation Report shall be prepared by a registered civil engineer or certified engineering geologist and include appropriate measures to minimize seismic hazards and ensure structural safety of the proposed structures.	Less than Significant
Impact 3.6-2: The project would not result in substantial soil erosion or the loss of topsoil.	Less than Significant	None required.	Less than Significant
Impact 3.6-3: The project would 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.	Less than Significant	None required.	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact 3.6-4: The project would not be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property.	Less than Significant	None required.	Less than Significant
Impact 3.6-5: The project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	Less than Significant	None required.	Less than Significant
Greenhouse Gas Emissions			
Impact 3.7-1: The project would generate greenhouse gas emissions that would have a less-than significant impact on the environment.	Less than Significant	None required.	Less than Significant
Impact 3.7-2: The 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 required.	Less than Significant
Impact 3.7-3: The project would not significantly alter air movement, moisture, or temperature, or cause any change in climate.	Less than Significant	None required.	Less than Significant
Hazards and Hazardous Materials			
Impact 3.8-1: The project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or reasonably foreseeable upset or accident conditions involving the release of hazardous materials into the environment, including, but not limited to oils, pesticides, chemicals, or radiation.	Less than Significant	None required.	Less than Significant
Impact 3.8-2: The project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	Less than Significant	None required.	Less than Significant
Impact 3.8-3: The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Less than Significant	None required.	Less than Significant
Impact 3.8-4: The project would not create any health hazard or potential health hazard, expose people to existing sources of potential health hazards, or result in unsafe conditions for employees, visitors, or students.	Less than Significant	None required.	Less than Significant
Hydrology and Water Quality			
Impact 3.9-1: The project could violate water quality standards or waste discharge requirements or	Potentially Significant	**Mitigation Measure 3.9-1: Conduct Soil/Sediment Testing.** Excavated and exposed soil and sediment at risk of erosion or mobilization will be tested for contaminants of potential concern (COPCs) for concentrations above SFBRWQCB's	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
otherwise substantially degrade surface or ground water quality; or result in discharge of pollutants into surface or ground waters or other alteration of surface or ground water quality (e.g., temperature, dissolved oxygen or turbidity).		Environmental Screening Levels (ESLs) for shallow soils, where groundwater is not a drinking water source, for commercial land use. Additional sampling results shall be compared to the Total Threshold Limit Concentrations (TTLCs) specified in California Code of Regulations (CCR) Title 22 Chapter 11 for hazardous waste identification. Soils will be tested prior to initiation of excavation activities to determine appropriate treatment, storage, and suitability for on-site onsite reuse, landfill disposal, or hazardous waste disposal.	
Impact 3.9-2: The project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: i. result in substantial erosion or siltation on- or off-site; ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or iv. impede or redirect flood flows.	Less than Significant	None required.	Less than Significant
Impact 3.9-3: The project would not risk release of pollutants as a result of project inundation due to tsunami	Less than Significant	None required.	Less than Significant
Impact 3.9-4: The project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	Less than Significant	None required.	Less than Significant
Impact 3.9-5: The project would not expose people or property to flooding hazards	Less than Significant	None required.	Less than Significant
Noise			
Impact 3.10-1: The project could 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.	Potentially Significant	**Mitigation Measure 3.10-1: Construction Noise Reduction Plan**. The District would adhere to this requirement and develop a construction noise reduction plan in compliance with local regulations to include measures to reduce construction noise impacts. These measures shall include, but not be limited to, the following: 1. Distribute to the potentially affected residences and other sensitive receptors within 200 feet of project construction boundary a "hotline" telephone number, which shall be attended during active construction working hours, for use by the public to register complaints. The distribution shall identify a noise-disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints and institute feasible actions warranted to correct the problem. All complaints shall be logged noting date, time, complainant's name, nature of complaint, and any corrective action taken. The distribution shall also notify residents adjacent to the project area of the construction schedule. 2. All construction equipment shall have intake and exhaust mufflers recommended by the manufacturers thereof. Further, pavement breakers and jackhammers shall also be equipped with acoustically attenuating shields or shrouds recommended by the manufacturers thereof. In lieu of or in the absence of manufacturers' recommendations, the	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Director of Public Works shall have the authority to prescribe such means of accomplishing maximum noise attenuation as he deems to be in the public interest, considering the available technology and economic feasibility. 3. Maintain maximum physical separation between noise sources (construction equipment) and sensitive noise receptors. Separation may be achieved by locating stationary equipment to minimize noise impacts on the community. 4. Impact tools (e.g., jack hammers) used during construction activities will be hydraulically or electrically powered where feasible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used. 5. Use construction noise barriers such as paneled noise shields, barriers, or enclosures adjacent to noisy stationary equipment such as generators, air compressors, jackhammers, etc. Noise control shields shall be made featuring a solid panel and a weather-protected, sound-absorptive material on the construction-activity side of the noise shield.	
Impact 3.10-2: The project would not result in generation of excessive groundborne vibration or groundborne noise levels.	Potentially Significant	**Mitigation Measure 3.10-2: Vibration Reduction Measures.** The District shall design the project to avoid intense vibration activities within five feet of the structures at Frederick Allen Park (e.g., avoid use of large bulldozer, jackhammer, hoe ram, or loaded trucks). If intense vibration generating activities cannot be avoided in proximity to structures, vibration monitoring shall be conducted during grading and floodwall construction activities in Frederick Allen Park to confirm vibration levels do not exceed vibration thresholds at the nearest receptors. If vibration levels approach the threshold of 0.3 PPV at the nearest structure, then construction practices shall be modified (i.e., use smaller types of construction equipment, operate the equipment in a manner to reduce vibration, or use alternate construction methods) so that the threshold is not exceeded.	Less than Significant
Public Services			
Impact 3.11-1: The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of thepublic services. i. Fire protection ii. Police protection iii. Schools iv. Parks v. Other public facilities	Less than Significant	None required.	Less than Significant
Impact 3.11-2: The project would not result in maintenance of public facilities, including roads.	Less than Significant	None required.	Less than Significant
Recreation			
Impact 3.12-1: The project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	Less than Significant	None required.	Less than Significant
Impact 3.12-2: The project would include recreational facilities or require the construction or expansion of	Less than Significant	None required.	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
recreational facilities, which might have an adverse physical effect on the environment.			
Impact 3.12-3: The project could affect existing recreational opportunities.	Potentially Significant	**Mitigation Measure 3.1-2: Large Tree Planting (see Aesthetics and Visual Resources above)** **Mitigation Measure 3.12-3: Temporary Shade Structures.** The District shall coordinate with the Town of Ross to select the type and location for installation of temporary shade structures in Frederick Allen Park. The temporary shade structures shall be located along the edge of the Bike Route 20 multi-use path and at seating areas as needed to provide shade during the vegetation establishment period. The temporary shade structures shall be removed when the tree canopy has sufficiently established to provide afternoon shade of the pathway and as determined through coordination with the Town of Ross. The District will submit a draft plan for the shade structures to the Town of Ross no less than 60 days prior to construction. **Mitigation Measure 3.14-1: Traffic Management (see Transportation and Circulation below)**	Less than Significant
		Transportation and Circulation	
Impact 3.13-1: The project could conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.	Potentially Significant	**Mitigation: Mitigation Measure 3.13-1: Traffic Management** Prior to initiation of construction, the Project contractor(s) shall use a qualified traffic engineer to prepare a Traffic Management Plan (TMP). The TMP shall be developed on the basis of detailed design plans. The TMP shall be reviewed and approved by the District and agencies with jurisdiction over roadways affected by project construction activities prior to construction. Once approved, the TMP shall be incorporated into the contract documents specification. The TMP shall include, but not necessarily be limited to, the elements listed below: • Develop a detour plan for bicycle and pedestrian traffic that shows the approach to reroute traffic on Bike Route 20 to Poplar/Kent Avenue from the College of Marin Parking lot to Ross Common. • Post signs providing public notice of detours at least 14 days prior to temporary bike route closure. • Provide flaggers at the tennis courts within Frederick Allen Park to provide safe pedestrian access to the tennis courts. • Control and monitor construction-vehicle movements by enforcing standard construction specifications through periodic on-site inspections. • Install traffic-control devices where traffic conditions warrant, as specified in the applicable jurisdiction's standards (e.g., the California Manual on Uniform Traffic Control Devices; Part 6: Temporary Traffic Control); flaggers would be used, when warranted, to control vehicle movements. • Implement a public information program to notify interested parties of the impending construction activities using means such as print media, radio, and/or web-based messages and information. • Comply with roadside safety protocols to reduce the risk of accidents. • Maintain access for emergency vehicles at all times. Provide advance notification to local police, fire, and emergency service providers of the timing, location, and duration of construction activities that could affect the movement of emergency vehicles on area roadways. • Store all equipment and materials in designated contractor staging areas on or adjacent to the worksite in such a manner as to minimize obstruction to traffic.	Less than Significant
Impact 3.13-2: The project would not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).	Less than Significant	None required.	Less than Significant
Impact 3.13-3: The project would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	Potentially Significant	**Mitigation Measure 3.13-1: Traffic Management (see above)**	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact 3.13-4: The project would not result in inadequate emergency access.	Less than Significant	None required.	
Tribal Cultural Resources			
Impact 3.14-1: The project could cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k); or ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	Potentially Significant	**Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources (see Cultural Resources above)**	Less than Significant
Utilities and Service Systems			
Impact 3.15-1: The project would not 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.	Less than Significant	None required.	Less than Significant
Impact 3.15-2: The project would have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years.	Less than Significant	None required.	Less than Significant
Impact 3.15-3: The project would not result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	Less than Significant	None required.	Less than Significant

Impact	Level of Significance Before Mitigation	Mitigation Measures	Level of Significance After Mitigation
Impact 3.15-4: The project would not 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.	Less than Significant	None required.	Less than Significant
Impact 3.15-5: The project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste.	Less than Significant	None required.	Less than Significant
Agriculture and Forestry Resources, Mineral Resources, Land Use and Planning, Population and Housing, Wildfire, and Socioeconomics			
Impact 3.16-1: The project would not physically divide an established community.	Less than Significant	None required.	Less than Significant
Impact 3.16-2: The project would not 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.	No Impact	None required.	No Impact
Impact 3.16-3: The project would not result in substantial alteration of the character or functioning of the community or present or planned use of an area.	Less than Significant	None required.	Less than Significant
Impact 3.16-4: The project would not induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure).	Less than Significant	None required.	Less than Significant

ES.11 References

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1 Introduction

1.1 Planning and Project Review Process

The Marin County Flood Control and Water Conservation District (District) is proposing the Corte Madera Creek Flood Risk Management Project, Phase 1 (project) to reduce 25-year flood risk along Corte Madera Creek in the Town of Ross and unincorporated Kentfield and to enhance natural stream functions. This Draft Environmental Impact Report (EIR) has been prepared by the District to describe the project, evaluate the potential for the project to result in adverse effects on the environment, and to consider alternatives to the project as proposed.

The District, a political subdivision of the state of California, is the California Environmental Quality Act (CEQA) Lead Agency for the project. The District's mission is to reduce the risk of flooding for the protection of life and property by implementing effective, transparent, and responsive planning, design, construction, operation, and maintenance of District-owned facilities such as stormwater pump stations, detention basins, bypass drains, creeks, ditches, and levees. The District provides these services to address specific flooding problems in eight zones1 in Marin County. Corte Madera Creek is within the District's Zone 9.

A Lead Agency is defined by Section 15367 of the CEQA Guidelines as the public agency that has the principal responsibility for carrying out or approving a project. The District intends to use this EIR in a decision process that also involves the Marin County Board of Supervisors, acting as the District Board, to evaluate the environmental impacts of the project and its alternatives. This EIR will become part of a body of evidence that the Board of Supervisors will use in deciding whether or not to approve the project. The District's planning and approval process involves two main steps including (1) circulation of the Draft EIR and (2) certification of the Final EIR and adoption of findings prior to approval of the project or an alternative. The CEQA process includes multiple opportunities for the public to comment on the project and the EIR.

The District is now circulating this Draft EIR to public agencies and members of the public for a 45-day public review period in accordance with CEQA Guidelines Section 15087. Comments should address the adequacy of the Draft EIR. Written comments will be accepted by the District until 4:00 p.m. on the closing day of the review period (March 17, 2021). Written comments should be submitted to the attention of Joanna Dixon, Project Manager at 3501 Civic

[1] These zones are Zone 1: Novato Area; Zone 3: Mill Valley/Coyote Creek Area; Zone 4: Bel Aire Area (Tiburon); Zone 5: Stinson Beach; Zone 6: San Rafael Meadows; Zone 7: Santa Venetia; Zone 9: Ross Valley; and Zone 10: Inverness.

Center Drive, Suite 304, San Rafael, CA 94903, or to cortemaderacreek@marincounty.org. Oral and written comments will be accepted at a hearing on the Draft EIR on Tuesday, March 2, 2021. The hearing will start at 9: 00 am.

After the close of the Draft EIR review period, the District will assemble all comments received during the public review period, including oral comments received at the public hearing on the Draft EIR. As required by CEQA Guidelines Section 15088, the District will evaluate comments received on the environmental issues addressed under CEQA and prepare written responses to each comment. The comments and responses will be included in the Final EIR.

The District will circulate the Final EIR to agencies that commented on the Draft EIR and all interested parties for a minimum of 10 days to review the responses to comments. The District Board will hold a public hearing to evaluate whether the Final EIR complies with CEQA. Notice of the public hearing will be provided in compliance with State law and the County's procedures.

Upon the conclusion of the review, the District Board will consider whether to certify the EIR. In certifying the EIR, the District Board would be affirming that the EIR is adequate and complete pursuant to CEQA requirements. In conjunction with a decision on the project, the District Board would also find that it reviewed and considered the information contained in the Final EIR and exercised its independent judgment prior to taking action on the project or any of the project elements (CEQA Guidelines Section 15090).

No action can be taken to approve the project or any of its elements until the Final EIR has been certified. However, certification of the EIR neither requires nor ensures approval of the project and its elements as evaluated in the EIR. Once the EIR is certified, the District Board may consider approval of the project. At that time, the District Board may decide to approve the project and the mitigation measures specified in the Final EIR, to disapprove the project, or to approve an alternative to the project or elements of alternatives that have been evaluated in the Final EIR.

1.2 Project History

The current project design and approach has been developed as a result of several decades of flood-control planning by the U.S. Army Corps of Engineers (USACE), litigation, and community opposition and concerns about various USACE project proposals. Congress directed the USACE to evaluate possible solutions to flooding in the vicinity of Corte Madera Creek under Section 11 of the Flood Control Act of 1944 in response to numerous flood events in the Corte Madera Creek watershed, including a flood in 1942 that caused major damage to surrounding communities. The Corte Madera Creek Flood Control Project (USACE Flood Control Project) was authorized by Congress in the Flood Control Act of 1962. The USACE Flood Control Project was originally conceived to consist of six units with a concrete-lined channel extending approximately 6.5 miles from the San Francisco Bay upstream into Fairfax. The USACE began construction of Units 1, 2, and 3 of the USACE Flood Control Project in 1969. Construction at the downstream end (Units 1 and 2) created a trapezoidal earthen channel and,

further upstream, a concrete-lined channel part way through the Town of Ross (Unit 3). Construction of Unit 4 as a concrete-lined channel was originally scheduled to begin in 1972, but further implementation of the USACE Flood Control Project beyond Units 1, 2, and 3 was stopped by litigation and environmental concerns from the surrounding community.

On March 5, 1996, the Marin County Board of Supervisors adopted Resolution 96-26, which recognized the need to complete Unit 4 and to redesign Units 2 and 3 under criteria established by the Zone 9 Advisory Board[2]. The criteria included minimizing the use of concrete, retaining adjacent recreational facilities such as the creekside multi-use pathway, using native plants, enhancing riparian and fish spawning habitat, and maximizing the channel capacity while retaining the Lagunitas Road Bridge, an historic structure, as is. The resolution also served as an official request that the USACE proceed with the Project at an overall lower level of design protection, which would meet the environmental concerns of the community. Following another major flood event in 1997, the USACE approved the Project Study Plan for Corte Madera Creek and reactivated the project in 1998. In 2005, following a flood event that damaged the fish ladder and demonstrated that flow restrictions at the Lagunitas Road Bridge existed, the District initiated a reevaluation of flow restrictions and necessary Flood Risk Management measures within the creek. By 2009, the USACE had initiated a General Reevaluation Report for the Project, and the Town of Ross undertook a separate project to replace the Lagunitas Road Bridge.

The USACE, through a local partnership with the District, reinitiated study and design of the USACE Flood Control Project and began preparation of an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Corte Madera Creek Flood Risk Management Project in 2015. The primary goal of the Corte Madera Creek Flood Risk Management Project was to manage flood risk from Corte Madera Creek associated with Unit 4 and to address any potential induced flooding as a result in Units 2 and 3. The USACE published the Draft EIS/EIR in October 2018 and received numerous comments from agencies and the public that indicated there were unresolved environmental issues as well as a lack of local support for elements of the project design.

Upon review of the public comments on the Draft EIS/EIR, the District recognized that additional analysis of project alternatives would be necessary to ensure that public and agency comments were adequately addressed in compliance with CEQA. The additional work would require supplemental funding and time, beyond the congressionally approved budget and schedule authorized for the USACE project feasibility study and as established in the agreement for the "General Reevaluation Report for Corte Madera Creek" (February 19, 2014) between the

[2] The Zone 9 Advisory Board convenes public meetings to review zone budgets, maintenance plans and potential construction projects, and to advise the District Board of Supervisors on all matters affecting Zone 9.

USACE and the District. The District Board of Supervisors decided to terminate the agreement with USACE as of December 31, 2019, and transition the project to a locally managed project.

The project has been redesigned by the District since transitioning the project to local leadership. The current project design reduces the scope of activities and addresses many of the concerns raised by the public in the 2018 Draft EIS/EIR. The current project has been designed in coordination with two stakeholders: Town of Ross, and Friends of Corte Madera Creek Watershed. The project is designed to provide 25-year flood risk reduction to residents and businesses within the Town of Ross and Kentfield. The project includes improvements to the Corte Madera Creek flood control channel within Unit 4, Unit 3, and Unit 2. The project elements and their general purpose and function are described in detail in Chapter 2 Project Description of this EIR.

1.3 Purpose of the EIR and Approach to Environmental Analysis

The fundamental purpose of an EIR is to inform the public and decision-makers of the potential effects of a proposed project on the physical environment. An EIR must therefore include a description of the "environmental setting" of a project (CEQA Guidelines, Section 15125[a]). The "environmental setting" is defined as "the physical environmental conditions in the vicinity of the project, as they exist at the time the Notice of Preparation (NOP) is published. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant" (*ibid*). Therefore, the physical conditions of the project area, the various proposed elements, and the surrounding areas at the time that the NOP was issued constitute the baseline, or point of departure, for the environmental analysis.

1.4 Responsible and Trustee Agencies

This EIR will be used by the District (as Lead Agency) and CEQA responsible agencies to ensure that they have met their requirements under CEQA before deciding whether to approve or permit project elements over which they have jurisdiction. Under CEQA, a responsible agency is a public agency, other than the lead agency, that has responsibility to carry out or approve a project (Public Resources Code [PRC] Section 21069). A trustee agency is a state agency that has jurisdiction by law over natural resources that are held in trust for the people of the State of California (PRC Section 21070).

Certification of the Final EIR by the Board of Supervisors is required before any other discretionary approval or permits would be issued for the proposed project. The project will require subsequent approvals and discretionary actions from responsible agencies including the Town of Ross, California Department of Fish and Wildlife (CDFW), and San Francisco Bay Regional Water Quality Control Board (RWQCB).

The following section discusses the state and local agencies who will serve as responsible and trustee agencies for this project. For a complete list of the anticipated permits and approvals

required for the project, and the agencies responsible for issuing those permits, refer to Chapter 2 Project Description, Section 2.8 Permits and Approvals of this EIR.

1.4.1 California Department of Fish and Wildlife

CDFW authorization of a Section 1602 Lake and Streambed Authorization Agreement is required in order to construct elements of the project within Corte Madera Creek. A 1602 permit is also required prior to removal of riparian vegetation, including trees adjacent to Corte Madera Creek.

1.4.2 San Francisco Bay Regional Water Quality Control Board

The San Francisco Bay RWQCB administers the National Pollutant Discharge Elimination System (NPDES) Permit Program, authorized by the federal Clean Water Act, as well as State laws to protect water quality. The project discharge of dredged or fill material within Corte Madera Creek will require RWQCB authorization through a Clean Water Act Section 401 Water Quality Certification. The Porter-Cologne Water Quality Control Act gives the RWQCB the authority to protect groundwater and surface waters of the State. A Groundwater General Permit would also be required for discharge or reuse of extracted brackish groundwater.

1.4.3 State Lands Commission

The State Lands Commission (SLC) has jurisdiction and management authority over all ungranted tidelands, submerged lands, and beds of navigable lakes and waterways. The SLC also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6009, subd. [c]; 6009.1; 6301; 6306). All tidelands and submerged lands granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the common law Public Trust Doctrine. The SLC is a trustee agency for the project because it could directly or indirectly affect State sovereign land and their accompanying Public Trust resources or uses. The project involves work on State sovereign land where the SLC will also act as a responsible agency.

1.4.4 Town of Ross

The Town of Ross owns Frederick Allen Park. The District will need to obtain Town of Ross approval of an easement for construction and maintenance of project elements on Town property. The District will enter into a maintenance agreement with the Town regarding maintenance of project elements within Frederick Allen Park. The Town is a responsible agency under CEQA in the review of project elements within Town jurisdiction. In addition, a Town of Ross tree removal permit is required prior to removing trees within the Town of Ross.

1.4.5 College of Marin

College of Marin owns properties where staging and stockpiling may occur for project construction. The project also includes new floodwalls within areas that could require new or modified easements from College of Marin. The District would obtain College of Marin approval for any required new or modified easement prior to construction. Should a new or

modified easement be required, the College of Marin is a responsible agency under CEQA in the review of the new or modified easement within the College of Marin properties.

1.5 Notice of Preparation and Scoping

On August 21, 2020, the District issued a NOP of a Draft EIR for the project pursuant to Section 15082 of the CEQA Guidelines. Publication of the NOP started the CEQA 30-day scoping period, during which the District requested comments from responsible and trustee agencies and the public about the scope of the EIR. The 30-day scoping period closed on September 21, 2020. The District held a virtual public scoping meeting on August 27, 2020, regarding the project to solicit agency and public input on the range of environmental effects and alternatives that should be analyzed in the EIR. Oral comments were received at the scoping meeting, and additional written comments were received during the scoping period. The Scoping Summary Report is included in Appendix A of this EIR. A summary of scoping comments is included below, in Table 1.5-1.

Table 1.5-1 Summary of Scoping Comments

Topic	Consideration
Project Description	• Describe Granton Park stormwater pump station. • Show area of temporary and permanent impacts, floodwalls, landscaping, and operational features. • Quantify earth disturbance and cubic yards of off-haul. • Identify trees that will be removed. • Provide details on floodwall and creek location within Frederick Allen Park. • Provide construction schedule. • Identify areas for construction staging and storage of materials. • Define dewatering and species relocation approach. • Define maintenance responsibilities.
Project Objectives	• State the purpose of the "Public Access and Recreational Quality" objective. • State the purpose of the "Fiscally Responsible" objective.
Alternatives	• Provide support for an alternative that only removes the fish ladder • Consider an alternative with floodwall designs that would provide habitat value and would be appropriate for the seawalls on Corte Madera Creek. • Consider an alternative that does not include the project element in the Town of Ross. • Consider an alternative that requires less concrete removal and uses more natural materials. • Consider an alternative that minimizes the need and height of the floodwalls. • Consider an alternative that would eliminate or reduce potentially adverse impacts from sea level rise. • Consider an alternative for area between Sir Francis Drake and Lagunitas Bridge. • Consider an alternative for drainage under Kent Avenue. • Consider an alternative that would address flooding to residents of Sylvan Lane and Shady Lane.

Topic	Consideration
Aesthetics and Visual Resources	• Consider impacts of tree removal on park setting and privacy.
Air Quality	• Consider air quality impacts at Frederick Allen Park from tree removal. • Address air quality impacts during construction.
Biological Resources	• Address impacts on sensitive species (including special-status plants, fish, and wildlife) and habitats. • Address impacts on fish and wildlife from the proposed creek access. • Address fish passage and fish pools improvement effects. • Address introduction of invasive species. • Address noise and vibration impacts on fish and birds. • Address impacts from tree removal. • Discuss revegetation and restoration in the project area. • Provide plans for dewatering and fish rescue.
Cultural and Tribal Cultural Resources	• Obtain approval for the final disposition of archaeological, historical, and paleontological resources recovered on State lands. • Exercise extreme diligence in honoring artifacts uncovered in the project area.
Geology and Soils	• Address impacts from sediment erosion and aggradation in the Frederick Allen Park Riparian corridor. • Incorporate geological information from Marin Countywide Plan into the EIR. • Address impacts on the structural integrity of the existing concrete channel from the proposed fish pools.
Greenhous Gas Emissions	• Address impacts from greenhouse gas emissions during construction and operation and consider impacts from disposal of the concrete that will be removed in Unit 2.
Hazards and Hazardous Materials	• Address potential impacts from waste entering the creek from surrounding areas. • Discuss increasing risk to public safety from the floodwalls and retaining walls. • Address public safety risk at Frederick Allen Park and potential for people to come in contact with rapidly moving water.
Hydrology and Water Quality	• Address impacts from sediment erosion and accumulation, including increased risk of erosion from tree removal. • Address impacts from rising tidal influence and sea level rise. • Address impacts on flow, hydraulics, sediment transport, and sedimentation from new fish pools. • Address impacts from induced flooding in Frederick Allen Park. • Address impacts from overload water flow from Bolinas Avenue, Fernhill, Southwood, Norwood, Ames, and Lagunitas Road. • Address impacts on the flow through Frederick Allen Park. • Discuss flood risk on Kent Avenue. • Discuss accuracy of modeling and calculations. • Compare the 10-year and the 25-year flood risk reduction benefits under existing conditions and existing with cumulative projects. • Address impacts on water quality.

Topic	Consideration
Noise	• Address noise impacts from the stormwater pump station. • Address noise impacts during construction. • Address increased noise from Sir Francis Drake Boulevard due to tree removal.
Recreation	• Address impacts on bicycle route and use of the multi-use pathway. • Discuss impacts on informal pedestrian pathways.
Transportation	• Address safety of bicyclists and pedestrians on realigned multi-use pathway. • Address impacts from construction truck trips. • Address impacts on access. • Address impacts on bike path.
Cumulative	• Address cumulative impacts from reasonably foreseeable future projects in the project vicinity. • Address flooding impacts in Granton Park from the access ramp.
General	• Define CEQA and regulatory procedures applicable to the project. • Address opposition to the project elements with Frederick Allen Park.

1.6 Organization of the EIR

The Draft EIR is organized into seven chapters, including the Executive Summary, preceded by the Table of Contents. A brief summary of the contents of the Draft EIR is presented below.

Executive Summary: The Executive Summary, prepared in accordance with CEQA Guidelines Section 15123, contains an overview of key elements of the Draft EIR and a summary of the project description and characteristics. An overview of project objectives, with reference to the full text version, is provided pursuant to CEQA Guidelines Section 15124. This chapter also presents a comprehensive table of all significant environmental impacts and mitigation measures along with the level of significance before and after mitigation. This chapter also summarizes impacts of the CEQA alternatives as they compare to the project. Descriptions of growth-inducing impacts, irreversible environmental changes, and significant and unavoidable impacts are also provided in this chapter. Also discussed are major conclusions, areas of controversy, and issues to be resolved in the Draft EIR. Finally, the project's consistency with County plans and policies is summarized.

Chapter 1 – Introduction: The Introduction describes the Marin County Planning and Program review process as it pertains to the project, presents the technical documents that are incorporated by reference into the Draft EIR (in accordance with CEQA Guidelines Section 15150), and describes the organization of the Draft EIR.

Chapter 2 – Project Description: The Project Description is prepared pursuant to CEQA Guidelines Section 15124 and contains text, figures, and tables conveying project attributes. Specifically, this chapter includes the project objectives, a description of the project elements and locations, and a description of project construction, operation, and maintenance.

Chapter 3 – Environmental Setting, Impacts, and Mitigation Measures: Chapter 3 contains most of the environmental impact evaluation for the project. A description of the physical and regulatory setting for each environmental issue is provided along with disclosure of the anticipated changes to physical conditions after project implementation. The "environmental setting," for purposes of this Draft EIR, consists of the existing physical conditions of the area affected by the project, including specific sites identified for project elements and their surroundings (pursuant to CEQA Guidelines Section 151259[a]). The existing physical conditions consist of the physical conditions at the time of NOP publication. Analysis of future conditions without project conditions is provided in the consideration of the No Project Alternative in Chapter 5. The impact analysis focuses on the potential changes to the physical environment that may result from the project. Feasible mitigation measures are identified for significant impacts that would result from implementation of the project, as appropriate.

Environmental impacts are numbered throughout this portion of the Draft EIR, beginning with the chapter section number, followed by sequentially numbered impacts. For example, the first impact in Section 3.2 Air Quality is impact number 3.2-1, and the second impact in this section is 3.2-2. Mitigation measures are numbered to correspond to impacts; therefore, mitigation measures to address Impacts 3.2-1 and 3.2-2 would be Mitigation Measures 3.2-1 and 3.2-2, respectively.

Chapter 4 – Growth-Inducing and Cumulative Effects: Chapter 4 includes CEQA-mandated sections examining the potential growth-inducing effects of the project and the project's significant cumulative impacts. Cumulative impacts refer to two or more individual effects that, when considered together, are considerable or compound other environmental impacts. In accordance with CEQA Guidelines Section 15130, the analysis in Chapter 4 examines the project's potential impacts in connection with the effects of other related past, present, and probable future projects.

Chapter 5 – Alternatives: In accordance with CEQA Guidelines Section 15126.6, Chapter 5 of the Draft EIR presents a range of reasonable alternatives designed to feasibly attain most of the basic objectives of the project and avoid or substantially reduce one or more of the project's significant environmental effects. The potential environmental impacts of the alternatives are discussed in comparison to the impacts that would result from the project, and the ability of the alternatives to meet the project objectives is presented.

Chapter 6 – Report Preparation: This chapter identifies the individuals who were involved in the preparation of the Draft EIR.

Appendices: The Draft EIR contains several appendices of technical or procedural materials that are pertinent to the analysis contained in the body of the document. See the Table of Contents for the full list of appendices.

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2 Project Description

2.1 Introduction

The Marin County Flood Control and Water Conservation District (District) is proposing the Corte Madera Creek Flood Risk Management Project, Phase 1 (project). The project is proposed as an element of the District's larger flood control program. The program is being implemented over many phases and multiple creeks throughout the District. Other flood control projects that are proposed for Corte Madera Creek, including Phase 2 of the Corte Madera Creek Flood Risk Management Project, are described in Section 4.3 Cumulative Impacts of this EIR. The District is the California Environmental Quality Act (CEQA) Lead Agency responsible for preparation of this Environmental Impact Report (EIR). The proposed project includes improvements to the concrete Corte Madera Creek flood-control channel constructed by the U.S. Army Corps of Engineers (USACE) in the 1960s and 1970s. The project improvements would be located within the Town of Ross and unincorporated Kentfield. The proposed channel improvements would improve fish passage and provide 25-year flood-risk reduction to residents and businesses within the Town of Ross and Kentfield.

2.2 Project Location

The project is located within the Corte Madera Creek watershed within the Town of Ross and unincorporated Kentfield, in Marin County, as shown in Figure 2.2-1. The project area is divided into three units, Unit 4, Unit 3, and Unit 2, which are based on the original USACE project units, as described in Table 2.2-1 and shown in Figure 2.2-2. Corte Madera Creek within the project area is concrete lined in Unit 3 and Unit 2 and currently has a natural bottom in Unit 4. The project area is approximately 1.4 miles long.

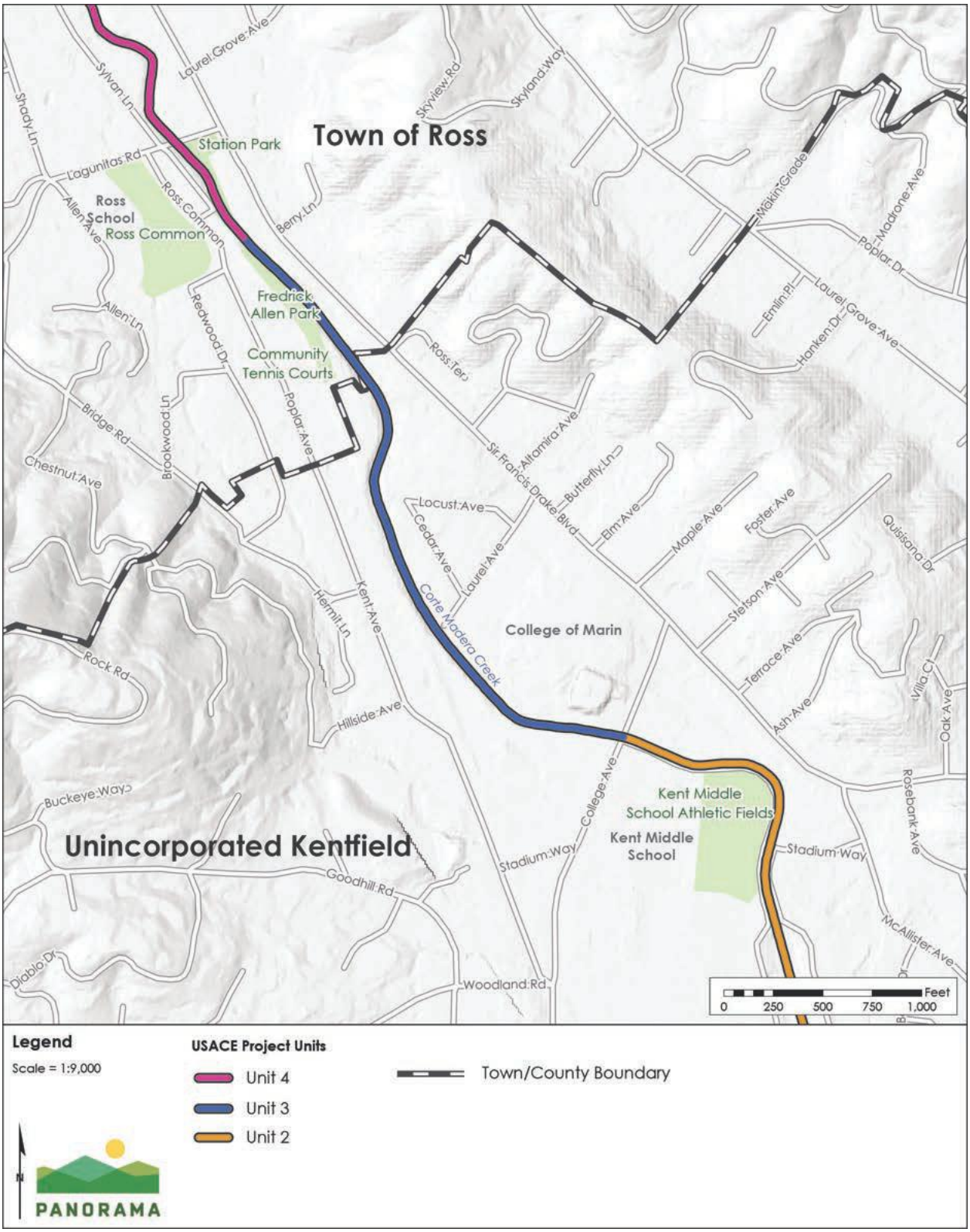
The Corte Madera Creek watershed contains 42 linear miles of stream channels and covers approximately 28 square miles, including areas of unincorporated Marin County and the towns of Corte Madera, Larkspur, Ross, San Anselmo, and Fairfax. Corte Madera Creek discharges into San Francisco Bay, 9 miles north of the Golden Gate Bridge. The Corte Madera Creek watershed's western boundary is a steep, forested ridge. Numerous creeks that drain steep upland areas onto relatively steep and laterally confined alluvial valley flats combine as San Anselmo Creek in Ross Valley at San Anselmo. San Anselmo Creek then flows southeast through Ross Valley. San Anselmo Creek flows into Corte Madera Creek west of Greenbrae at the confluence with Ross Creek. Upper reaches within the watershed support relatively natural stream channels. The lower ridges and valley areas of the watershed, including areas adjacent to Corte Madera Creek, are highly developed suburban residential and commercial areas. Within the project area, the creek is channelized with a combination of narrow, incised banks and a concrete-lined channel.

Figure 2.2-1 Project Location



Sources: (U.S. Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011)

Figure 2.2-2 USACE Creek Units



Sources: (Tele Atlas North America, Inc., 2019; GHD, 2020h; USGS, 2019; U.S. Geological Survey, 2013)

Table 2.2-1 Corte Madera Creek Units within the Project Area

Unit [a]	Length (miles)	Description of Reach
Unit 4	0.2	Unit 4 extends approximately 0.4 mile downstream from Sir Francis Drake Boulevard and continues approximately 600 feet downstream of the Lagunitas Road Bridge before terminating at the wooden fish ladder. The project segment of Unit 4 starts just upstream of Lagunitas Road Bridge and extends approximately 1,100 feet downstream to the wooden fish ladder.
Unit 3	0.67	Unit 3 begins at the wooden fish ladder at the upstream end of the concrete channel and continues for approximately 0.67 mile to the College Avenue Bridge.
Unit 2	0.57	Unit 2 begins at the College Avenue Bridge and extends downstream beyond the end of the concrete channel, ending near the Tamalpais Creek culvert. The upper and middle (henceforth for the purposes of this project referred to as lower College of Marin concrete channel removal or lower Unit 2) portions of Unit 2 consist of an approximately 0.33-mile concrete channel that extends from the College Avenue Bridge to downstream of Stadium Way. The lowest portion of Unit 2, which is not a part of the project area, extends downstream into the earthen channel to Bon Air Road bridge.

Note:

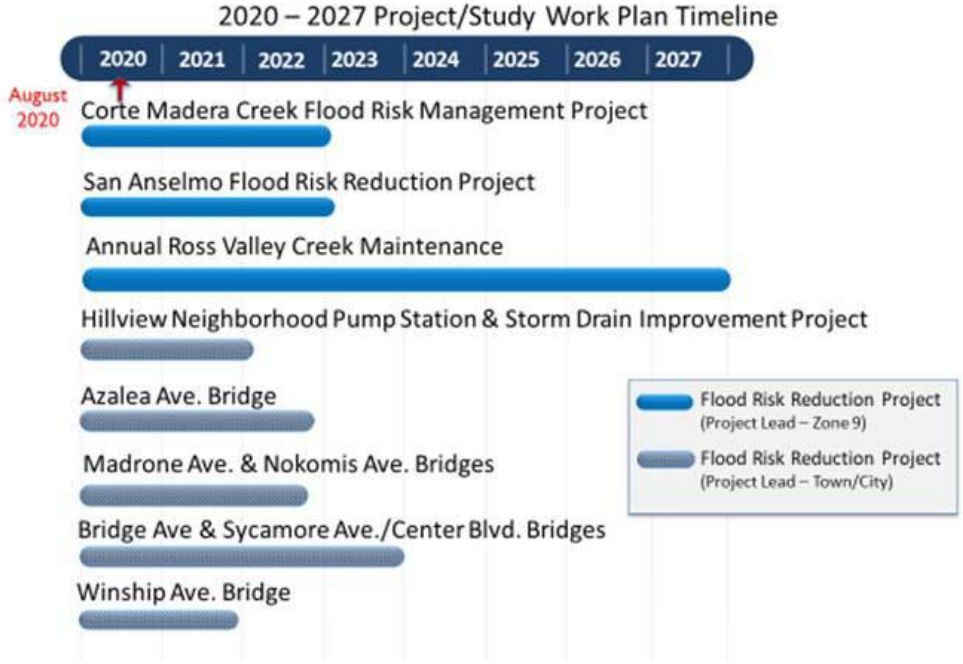
[a] Units are ordered from upstream (Unit 4) to downstream (Unit 2)

2.3 Background

2.3.1 Ross Valley Flood Protection and Watershed Program Summary

Ross Valley has been inundated by flooding over the years, including significant winter storm events in 1956, 1982, 2005, and 2017, causing tens of millions of dollars in damages. The most recent major flood occurred on December 31, 2005. The flood resulted in substantial property damage within the Ross Valley. In January 2006, the Ross Valley Watershed Flood Protection and Watershed Program (Program) was initiated by Marin County Board of Supervisors. The Program was intended to create a comprehensive flood control strategy for the Ross Valley watershed. The Program, which is managed by the District, strives to improve public safety and protect property in the 28-square-mile watershed. The proposed project is one of several flood-risk reduction projects that are currently being planned by the District in the watershed. The work plan for the Ross Valley Flood Protection and Watershed Program is provided in Figure 2.3-1.

Figure 2.3-1 Ross Valley Flood Protection and Watershed Project Study Work Plan Timeline



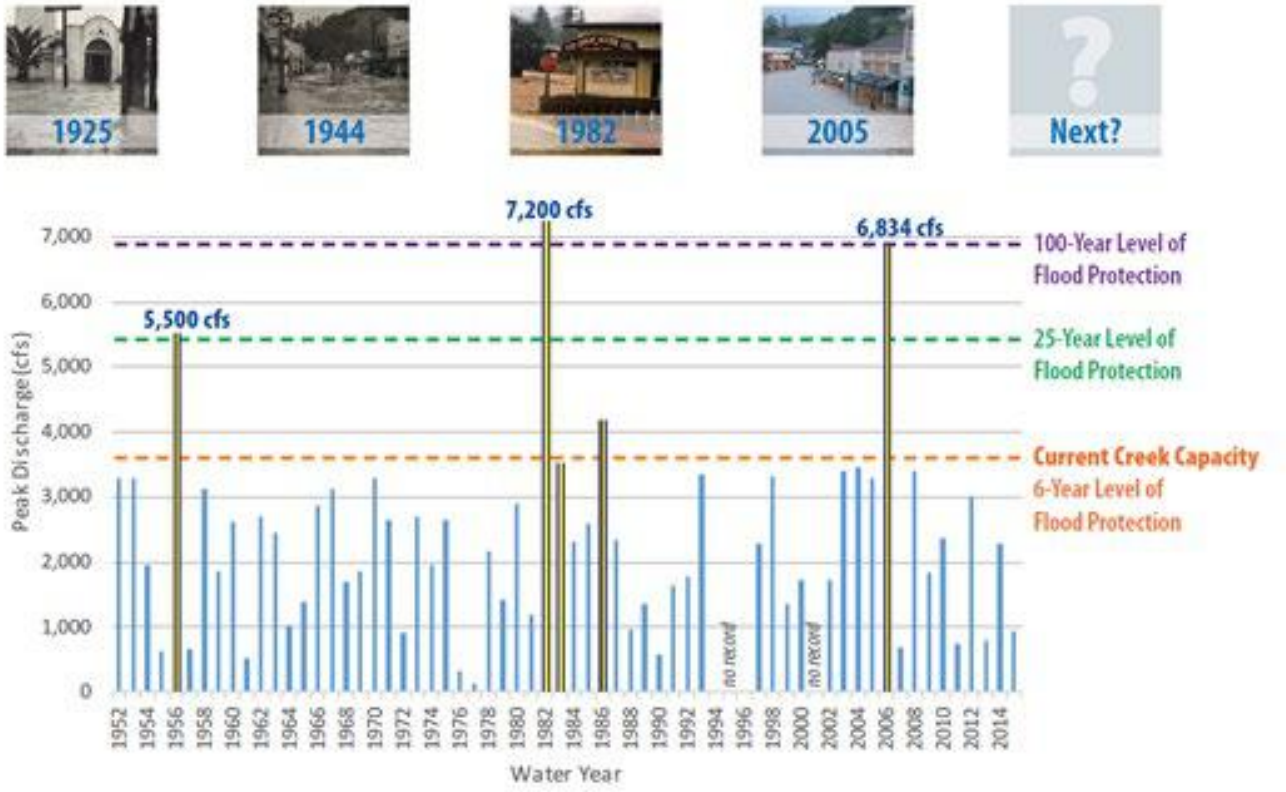
Source: (Marin County Flood Control and Water Conservation District, 2020)

2.3.2 History of Flooding and Flood Control in Ross Valley and the Corte Madera Creek Watershed

Several times in recent history, Ross Valley has been flooded by Corte Madera Creek and its upstream tributaries. Flooding was reported as far back as the 1860s and in calendar years 1914, 1925, 1937, 1940, and 1942 prior to establishment in 1951 of the United States Geological Survey (USGS) streamflow gage in Ross. Corte Madera Creek has flooded the project vicinity numerous times over the past 70 years, causing loss of human life and major damage in nearby communities of San Anselmo, Ross, Kentfield, and Larkspur. Since 1951, flood events have been recorded in calendar years 1951, 1952, 1958, 1967, 1969, 1970, 1982, 1983, 1986, 1993, 2005 and 2017. Of these, the two most severe floods occurred in 1982 and 2005, with peak discharges of approximately 7,200 cubic feet per second (cfs) and 6,834 cfs, respectively.

The percent-annual-chances (i.e., probabilities) of these floods were approximately 0.6 percent and one percent (translating to a 100- to 200-year flood event and a 100-year flood event, respectively) (Figure 2.3-2) (Stetson Engineers, Inc., 2011). Historical flooding has caused extensive property damage and economic hardship to residents, businesses, and local governments. In the 2005 flood, losses to the public and private sector totaled $94,836,880 in 2006 dollars (Marin County, 2012). Following the 1956 flood, Congress directed the USACE to evaluate possible solutions to flooding in the vicinity of Corte Madera Creek under Section 11 of the Flood Control Act of 1944. The Corte Madera Creek Flood Control Project (USACE Flood Control Project) was authorized by Congress in the Flood Control Act of 1962.

Figure 2.3-2 Corte Madera Creek Historical Annual Peak Discharges



Source: (Marin County Flood Control and Water Conservation District, 2020)

The USACE Flood Control Project was originally conceived to consist of six units with a concrete-lined channel extending approximately 6.5 miles from the San Francisco Bay upstream into Fairfax. The USACE began construction of Units 1, 2, and 3 of the USACE Flood Control Project in 1969. Construction at the downstream end (Units 1 and 2) created a trapezoidal earthen channel and, further upstream, a concrete-lined channel part-way through the Town of Ross (Unit 3). Construction of Unit 4 as a concrete-lined channel was originally scheduled to begin in 1972, but further implementation of the USACE Flood Control Project beyond Units 1, 2, and 3 was stopped by litigation and environmental concerns from the surrounding community.

2.3.3 Previous Environmental Review

The USACE, through a local partnership with the District, reinitiated study and design of the USACE Flood Control Project and began preparation of an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Corte Madera Creek Flood Risk Management Project in 2015. The primary goal of the Corte Madera Creek Flood Risk Management Project was to manage flood risk from Corte Madera Creek associated with Unit 4 and to address any potential induced flooding as a result in Units 2 and 3. The USACE published the Draft EIS/EIR in October 2018 and received substantial comments from agencies

and the public that indicated there were unresolved environmental issues and a lack of local support for elements of the project design.

Upon review of the public comments on the Draft EIS/EIR, the District recognized that additional analysis of the project alternatives would be necessary to ensure that public and agency comments were adequately addressed in compliance with CEQA. The additional work would require supplemental funding and time beyond the congressionally-approved budget and schedule authorized for the project feasibility study and as established in the agreement for the "General Reevaluation Report for Corte Madera Creek" (February 19, 2014) between the USACE and the District. The District Board of Supervisors decided to terminate the agreement with USACE as of December 31, 2019 and transition the project to a locally-managed project.

Since project planning shifted from the USACE to local District leadership and management, the project has been substantially redesigned to reduce the scope of activities and address many of the concerns raised by the public in the 2018 Draft EIS/EIR, including omission of a proposed bypass pipeline along Sir Francis Drake Boulevard. The current project has been designed in coordination with two stakeholders: Town of Ross and Friends of Corte Madera Creek Watershed. The project is designed to provide 25-year flood risk reduction to residents and businesses within the Town of Ross and Kentfield. The project includes improvements to the Corte Madera Creek flood control channel within Unit 4, Unit 3, and Unit 2. Additional flood control and stream restoration elements, including additional restoration on College of Marin campus, are being considered for a Phase 2 project on Corte Madera Creek. Separate CEQA documentation and analysis will be required prior to implementation any Phase 2 project components. While Phase 2 has not been fully defined, potential Phase 2 components are described and considered in Section 4.3 Cumulative Impacts of this EIR.

2.4 Project Objectives

CEQA requires EIRs to include a clearly written statement of objectives that succinctly describes the underlying purpose of the project being evaluated. The objectives serve to guide the development and evaluation of a reasonable range of alternatives to evaluate in the EIR and support the decision-making process.

The objectives of the project include the following:

1. **Flood-Risk Reduction.** Reduce overall flood inundation extent and depth in the Town of Ross and Kentfield areas.
2. **Environmental Benefits.** Improve fish passage, natural creek processes, and fish and riparian habitat adjacent to the creek.
3. **Public Access and Recreational Quality.** Maintain public access along the creek via the multi-use path and enhance the recreational experience and amenities along the creek corridor to meet Town of Ross and Kentfield area community needs.

4. **Operational Reliability.** Improve operational reliability and reduce long-term maintenance costs through improving channel stability and protecting existing utilities.
5. **Regulatory Compliance.** Comply with local, state, and federal environmental laws and regulations.
6. **Fiscally Responsible.** Implement a flood-risk reduction project that can be accomplished with local and reasonably foreseeable grant-funding opportunities.

The primary drivers for the project are reduction in flood risk and improvement in ecological functions, including fish passage. Implementing the project would reduce the frequency of flooding in the Town of Ross and Kentfield and reduce the severity of flooding by reducing the total area of inundation adjacent to Corte Madera Creek. The flood risk reduction benefits of the project are demonstrated in the hydraulic modeling results for the change between existing conditions and proposed-project condition modeling. Hydraulic modeling results for the 10-, 25-, and 100-year flood events are presented in detail in Section 3.9 Hydrology and Water Quality.

2.5 Project Elements and Design

2.5.1 Proposed Project Element Types

The proposed project includes project elements that would increase flow conveyance capacity, provide flood protection, and/or enhance habitat within Corte Madera Creek. The project elements and their general purpose and function are described below. The proposed project elements are shown on Figure 2.5-1 through Figure 2.5-3.

Increase Creek Flow Conveyance Capacity

Project elements that increase creek capacity allow a greater volume of water to flow in-channel rather than overflowing along the streets and floodplains and flooding adjacent areas. Maximizing the in-channel flood-flow capacity is accomplished by widening and/or deepening certain sections of creeks in the watershed, creating and/or restoring functional floodplains, and modifying, removing, or replacing structures, including bank protection, that encroach into the creek. Capacity-increasing project elements that would be constructed as part of the proposed project include the following:

- Removal of the concrete channel and widening the channel within Frederick Allen Park
- Removal of the fish ladder at the upstream limit of Unit 3
- Regrading and lowering the channel in Unit 4
- Installation of new grade control and slope protection in Unit 4 and Frederick Allen Park
- Floodplain expansion and partial concrete channel wall removal in Unit 2 at the downstream of Stadium Way bridge

Figure 2.5-1 Project Elements (Map 1 of 3)



Source: (GHD, 2020a) (Stetson Engineers, Inc., 2020) (geomorphDESIGN, 2020b) (Tele Atlas North America, Inc., 2019) (Golden Gate National Parks Conservancy, 2018)

Figure 2.5-2 Project Elements (Map 2 of 3)



Source: (GHD, 2020a) (Stetson Engineers, Inc., 2020) (Tele Atlas North America, Inc., 2019) (Golden Gate National Parks Conservancy, 2018)

Figure 2.5-3 Project Elements (Map 3 of 3)



Source: (GHD, 2020a) (geomorphDESIGN, 2020) (Stetson Engineers, Inc., 2020) (Tele Atlas North America, Inc., 2020) (Golden Gate National Parks Conservancy, 2018)

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Flood Protection Elements

Flood-protection elements are structures that play an essential role in diverting water away from communities or reducing flooding within communities that occur adjacent to the creek. Flood-protection elements, such as short floodwalls, protect communities within the floodplain by maintaining flow in the creek. Flood-protection elements that would be constructed as part of the proposed project include the following:

- New/modified short floodwalls (approximately 2 to 4 feet tall) in Unit 3 and Unit 2
- Stormwater pump station with backup power in Granton Park

Elements that Enhance Creek Habitat

Creek habitat enhancement involves increasing natural conditions both in the channel and adjacent to the creek by removing concrete and structures that restrict flow, obstruct fish passage, or block natural vegetation establishment. Corte Madera Creek provides important habitat for threatened and endangered species including but not limited to salmonids, particularly resident rainbow trout and steelhead trout, as well as the Ridgway's rail and the salt marsh harvest mouse, which occupy the tidal marshes downstream of the project area. The tidal marsh, freshwater aquatic, and creek riparian habitats have all been reduced and degraded by human activitiesSalmonids returning from the ocean to spawn in Corte Madera Creek must first enter the downstream outlet of the concrete flood control channel near the College of Marin and pass upstream through the channel to enter the still largely natural creek corridor behind the Ross Post Office. The Denil fish ladder and the existing concrete channel have been identified as impediments to fish passage because typical natural flows during the migration season produce shallow, high-velocity flows on the smooth concrete bed, there are insufficient resting pools for fish passage, and there is no pool below the fish ladder to accommodate fish attempting to jump up the ladder.

Habitat enhancement elements included in the proposed project would create conditions that promote fish habitat and passage and restore tidal, wetland, and riparian habitat along the creek. Habitat-enhancing project elements included in the proposed project include the following:

- Removal of the Denil fish ladder
- Riparian vegetation plantings in Frederick Allen Park
- New and enlarged fish pools within the concrete channel in Unit 3
- Removal of a portion of the concrete channel and restoration of tidal wetland and transitional habitat in Unit 2.

2.5.2 Project Design

Project elements proposed within Unit 4, Unit 3, and Unit 2 of Corte Madera Creek are summarized in Table 2.5-1 and shown on Figure 2.2-2. A detailed description of the elements within each unit is provided following the table.

Table 2.5-1 Proposed Project Elements by Creek Unit

Unit	Description of Project Element
Unit 4	• **Capacity-increasing elements.** The grade of the channel would be lowered, the channel would be widened, and the channel elevation and banks would be stabilized through installation of grade-control structures and bank stabilization. • **Habitat-enhancing elements.** The Denil fish ladder would be removed, and riparian vegetation would be planted along the creek banks to increase vegetation and water interaction within the creek.
Upper Unit 3 (Frederick Allen Park)	• **Capacity-increasing elements.** The concrete channel would be removed, and a new, wider earthen channel and floodplain would be constructed within the existing channel and Frederick Allen Park. • **Flood-protection elements.** New floodwalls would be installed along the park to protect adjacent private property. • **Habitat-enhancing elements.** Habitats in and around the creek would be enhanced within the park by removing the concrete channel and planting vegetation along the creek banks to provide increased shade and interaction between water and vegetation, thereby providing more natural creek conditions.
Unit 3	• **Flood-protection elements.** New and modified floodwalls would be installed within the Granton Park neighborhood. A new stormwater pump station would also be constructed. • **Habitat-enhancing elements.** New and enlarged fish pools would be constructed within the concrete channel in Unit 3.
Unit 2	• **Flood-protection elements.** A new floodwall would be constructed along the upper reach of Unit 2. • **Habitat-enhancing elements.** Creek habitat would be enhanced by replacing the concrete channel with an earthen channel and vegetation downstream of Stadium Avenue. • **Improvement elements.** Replacement of existing storm drains. Improvements to the existing multi-use path and creation of an adjacent vest pocket park.

2.5.3 Project Features Within Each Unit

Unit 4

The proposed work within Unit 4 would occur within the lower reach of the unit from the upstream end of the existing concrete channel to approximately 150 feet upstream of the Lagunitas Road Bridge. Proposed project activities include removal of the existing fish ladder, grading within the channel and banks to maintain channel geomorphic stability and increase hydraulic capacity, transition structure from the natural channel to the concrete channel, and channel stabilization measures including planted rock, vegetated soil lifts, erosion-control fabric, and engineered streambed material.[1] The improvements also include installation of

[1] Engineered streambed material is a well-graded rock material that includes a gradation of boulders, cobbles, gravel, and sand.

riprap and short cast-in-place concrete walls adjacent to existing concrete walls to reinforce those walls. Unit 4 elements are described below and shown on Figure 2.5-1.

Fish Ladder Removal and Transition Element
The Denil fish ladder would be replaced with a combination of natural bed material and biotechnical bank stabilization or stone protection treatments to eliminate the hydraulic jump and create a smooth transition between Unit 3 and Unit 4. The transition element would extend approximately 80 feet upstream from the existing concrete channel inlet and would involve grading the channel and banks to provide a hydraulically gradual and smooth transition from the upstream natural channel with sloping banks to the downstream Unit 3 channel at Frederick Allen Park with vertical retaining walls. Concrete or riprap aprons would be constructed to extend vertically up the creek banks and meet the existing concrete channel downstream of the transition element. New concrete retaining walls up to 10 feet tall and matching the downstream retaining wall height at Frederick Allen Park would be constructed at the top of the concrete apron. The existing wooden retaining walls would be abandoned.

Channel Stabilization, Grade Control and Reinforcement
As a result of removing the fish ladder, channel modifications would be necessary to accommodate the change in flow dynamics. This would also create the need to modify and lower the channel floor elevations to allow for a smooth transition and geomorphologically stable channel bed. The channel bed modification would extend from the fish ladder to approximately 150 feet upstream of Lagunitas Road Bridge. Approximately 115 feet of the natural channel between Lagunitas Road Bridge and the fish ladder would be widened to increase hydraulic conveyance capacity.

Site-specific creek-bank toe protection and bank stabilization would be installed. Toe protection may include a new buried rock keyway, bioengineered stabilization using willows and other native planting, and reinforced concrete wall. Additional channel stabilization and reinforcement would include installation of erosion-control fabric and engineered streambed material. While most of the anticipated improvements would be completed within property owned by the District, some of the toe protection work would occur along the bottom of the creek banks within the adjacent private properties. Each stabilization and reinforcement technique is described below and shown in Figure 2.5-1.

- **Buried rock keyway.** Large rock (half ton) would be installed ("planted") directly upstream of the proposed transition element and further upstream. Approximately 130 to 140 square feet of rock would be installed on each creekbank to protect the proposed transition element from scour. Approximately 1,385 square feet (265 linear feet) of planted rock would also be installed along the Unit 4 left[2] bank adjacent to private property to protect the creek bank and existing gabion basket

[2] Project features are identified as located on the right or left bank of the creek as viewed when facing downstream.

wall from scour. Along the right creekbank, approximately 790 square feet (105 linear feet) of planted rock would be installed along the creekbank near the Ross Post Office.

- **Biotechnical stabilization.** Biotechnical stabilization would occur through the installation of vegetated soil lifts[3]. Approximately 530 square feet of vegetated soil would be installed along the creekbank adjacent to the Ross Post Office. The vegetated soil would be installed upslope of the planted rock.
- **Erosion-control fabric**. A double layer of erosion-control fabric would be installed along creekbank upstream of the transition element and along the creekbank near the Ross Post Office, above the installed vegetated soil lift.
- **Engineered streambed material.** Approximately 660 square feet of engineered streambed material would be installed directly upstream of the transition element.
- **Reinforced concrete sister wall** A new reinforced concrete sister wall would be constructed adjacent to an existing concrete retaining wall to reinforce the toe of the existing wall. The reinforced concrete sister wall would extend 75 linear feet on the left bank adjacent to private property at 27 Sir Francis Drake Blvd.

Frederick Allen Park

Project elements proposed within Frederick Allen Park would occur within the park boundary owned by the Town of Ross and on District property (i.e., within the existing concrete channel) in the upper reach of Unit 3. The Frederick Allen Park improvements include removal of the concrete channel, construction of concrete floodwalls, removal of trees (see Section 2.6.2), and excavation and grading within the channel and park to provide creek corridor widening and natural floodplain benches and banks connecting to Frederick Allen Park. The improvements also include new landscaping and a pedestrian path within the park. Elements proposed within Frederick Allen Park are described below and shown on Figure 2.5-1 and Figure 2.5-4. The tree removal and planting plan is provided in Appendix B.

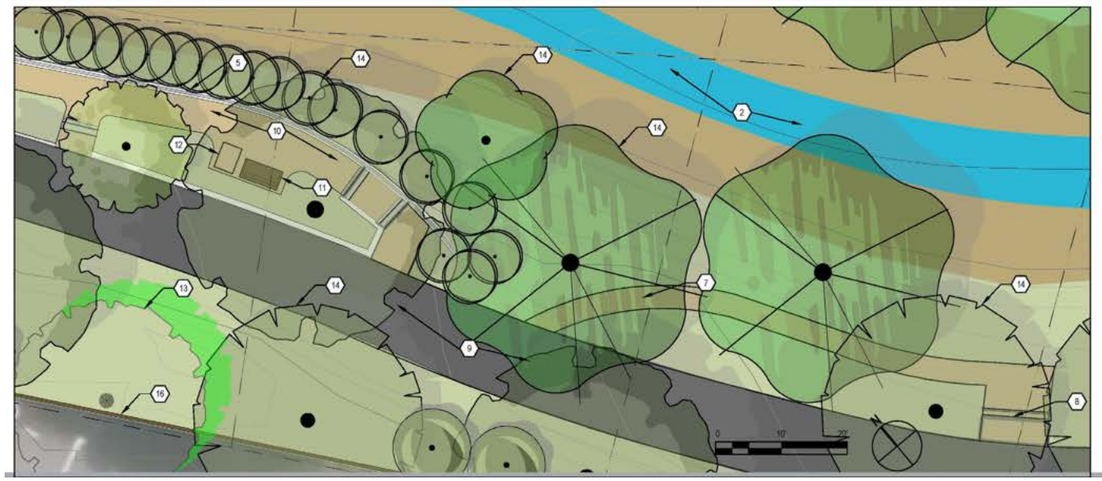
Short Floodwalls

New short, cast-in-place floodwalls, would be constructed along the western and eastern edge of the Frederick Allen Park area with a height of up to 2 feet above grade. The western floodwall would begin approximately 330 feet downstream of the existing fish ladder, and would extend 80 linear feet along the western edge of the park boundary. The eastern floodwall would be approximately 2-feet high and would extend 240 linear feet. The eastern floodwall would be located on District property, adjacent to 11 and 3 Sir Francis Drake Boulevard on the eastern (left) bank of the creek.

[3] A vegetated soil lift consists of soil encapsulated or wrapped in a facing element or fabric such as a rolled erosion-control product, or a combination of erosion-control products, that also act as a reinforcing element.

Figure 2.5-4 Frederick Allen Park Site Plan





LEGEND

1. PARCEL BOUNDARY, TYP
2. NATURALIZED CORTE MADERA CREEK
3. EXISTING CHANNEL RETAINING WALL
4. NEW FLOOD WALL
5. NEW CHANNEL RETAINING WALL
6. SEWER LINE
7. FOOT PATH TO CREEK EDGE
8. STAIRS TO CREEK EDGE
9. BIKE PATH (5% SLOPE MAX)
10. CREEK OVERLOOK W/FOOTPATH (5% SLOPE MAX)
11. BENCH
12. WHEELCHAIR REST
13. EXISTING TREE/SHRUB TO REMAIN, TYP
14. NEW TREE/SHRUB, TYP
15. REALIGN EXISTING FOOTPATH AS NEEDED
16. BOUNDARY FENCE

PRELIMINARY

Source: (GHD, 2020g)

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Channel Improvements

Upstream of the Kentfield Hospital Bridge within Frederick Allen Park, Corte Madera Creek would be restored to a more natural appearing and functioning stream. The existing concrete channel and walls between the fish ladder and approximately 200 feet upstream of Kentfield Hospital Bridge would be removed and replaced with natural substrate. The channel corridor in Frederick Allen Park would include a natural geomorphic channel with channel meander and connected riparian floodplain. The change in channel conditions would be created by widening and re-grading the channel along the left and right banks. The left bank would be sloped, and the top of the channel would shift approximately 10 to 15 feet to the east within the District's property. The channel meander would create a low bar or bench on the left bank, which would be inundated frequently by floods. The channel would be widened on the right bank, on District and Town of Ross property. Frederick Allen Park would be re-graded and re-designed to provide a new, small floodplain bench by lowering a portion of the existing park. The floodplain bench would be approximately 8 feet lower than the existing ground elevation within the park and would be hydraulically connected to Corte Madera Creek, with the intent that this area would flood during high water events. The floodplain on both sides of the creek would be revegetated with willows and other riparian vegetation to establish riparian habitat adjacent to the creek. Short floodwall segments, approximately 2 feet tall, would be installed on the left and right banks and are incorporated into the landscape design for the park.

Park Improvements

Park improvements would include construction of a new pedestrian path and tree planting adjacent to the path to shade the realigned pathway. The existing multi-use path in the park would be relocated along the western edge of the park to allow additional room for the floodplain and natural channel. Resting areas with seating and educational signage would be constructed along the realigned pathway. The pathway would gently lower in grade by less than five percent along this newly realigned length from the tennis courts to the park entrance. From the low point in the pathway, boulders would provide areas for seating and access to the natural creek channel. A retaining wall would be installed at the entrance to the park, and benches would be provided at an overlook area. A short wall or fence would be installed at the top of the retaining wall and any areas with steep drops for safety. A split rail fence would also be installed along the length of the new top of the channel to prevent encroachment into habitat areas. The split-rail fence could be removed after the habitat is established. Trash receptacles would be placed at seating areas. Graphics showing the proposed park improvements at the time of construction, five years after construction, and 10 years after construction are provided in Section 3.1 Aesthetics.

Unit 3

The proposed work within the lower reach of Unit 3 includes the construction of floodwalls, a storm drain pump station at Laurel Avenue, adjacent to the channel's left bank, and up to 16 fish pools within the channel. Elements proposed within the lower reach of Unit 3 are described below and shown on Figure 2.5-2.

Floodwalls

Two floodwall segments would be constructed in the lower reach of Unit 3. A new floodwall would be constructed along the left bank on the upstream side of the College Avenue bridge. Approximately 60 feet of new floodwall would be constructed and designed to function as a wing wall to divert channel flow to Corte Madera Creek at the College Avenue bridge crossing. The floodwall would be 2 to 4 feet tall with the exception of small low-lying areas where the wall could be up to6 feet in height.

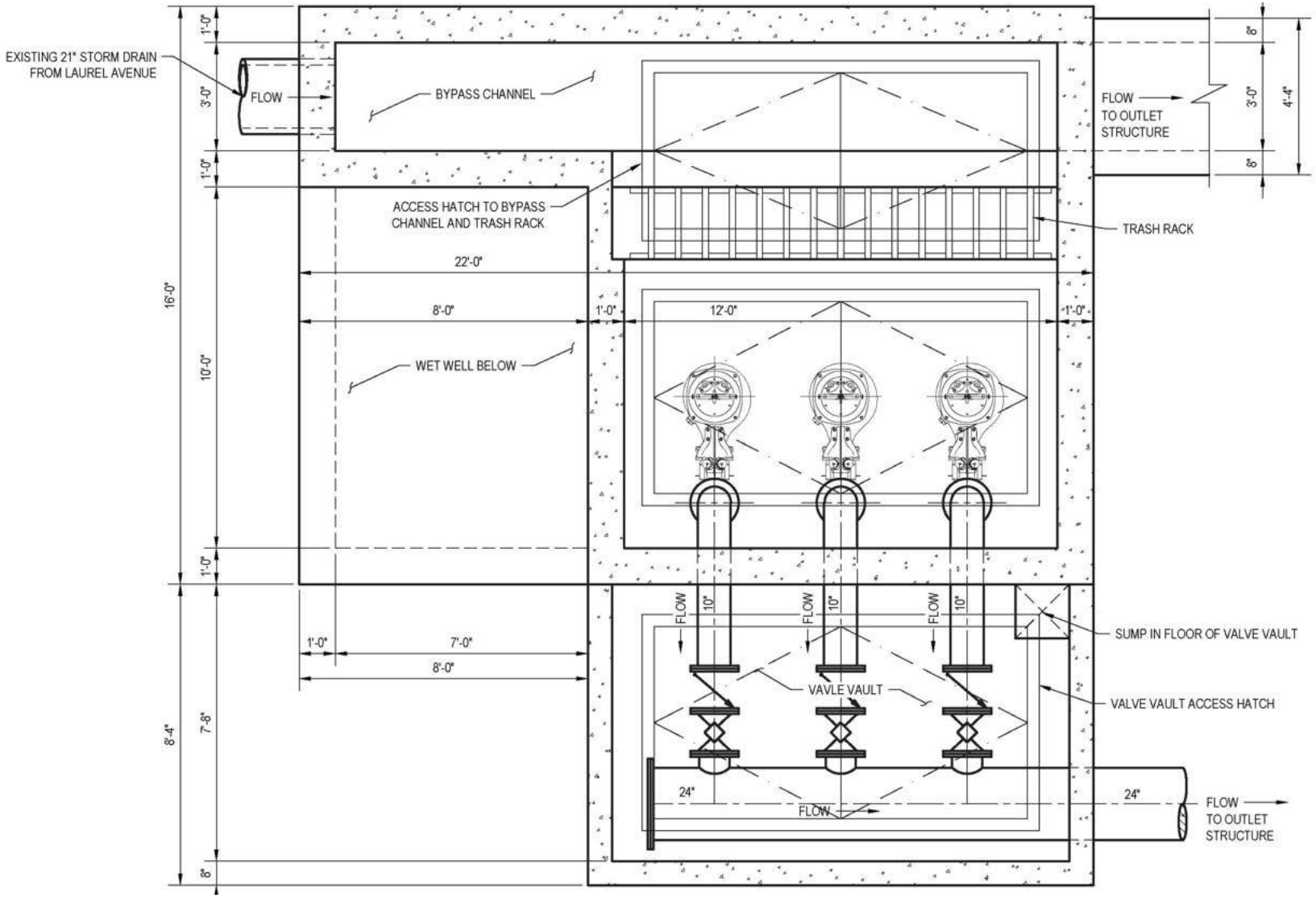
The existing concrete channel floodwall, which currently extends to grade, would be extended vertically along the left bank of Unit 3, upstream of the College of Marin Science-Math-Nursing building (SMN) Bridge. The addition to the existing concrete floodwall would extend along approximately 1,075 feet of the concrete channel, would be one foot wide, and 2 to 4 feet high above the existing concrete channel. The floodwall would be constructed on top of the existing concrete channel wall as a structural extension of the existing channel structure or would be set back a few feet from the existing wall to provide additional flood control. If constructed on top of the existing wall, a fence would be installed as needed for public safety.

Stormwater Pump Station and Backup Power

A new stormwater pump station would be constructed adjacent to the left bank of the concrete channel, approximately 250 feet upstream of the SMN Bridge. The pump station would be located within the District's property at Laurel Avenue. The pump station would convey runoff from the Granton Park neighborhood and the tributary area to the east of Sir Francis Drake Boulevard into Corte Madera Creek. The pump station would supplement the two existing storm drain pipelines in the area that currently discharge water to the channel via gravity flow. The pump station would run only during high channel water levels concurrent with a storm event, when water backs up to the storm drainpipes along Laurel Avenue. The pump station would be designed with 25-year storm capacity when the largest pump in the pump station is off and 100-year-storm maximum capacity.

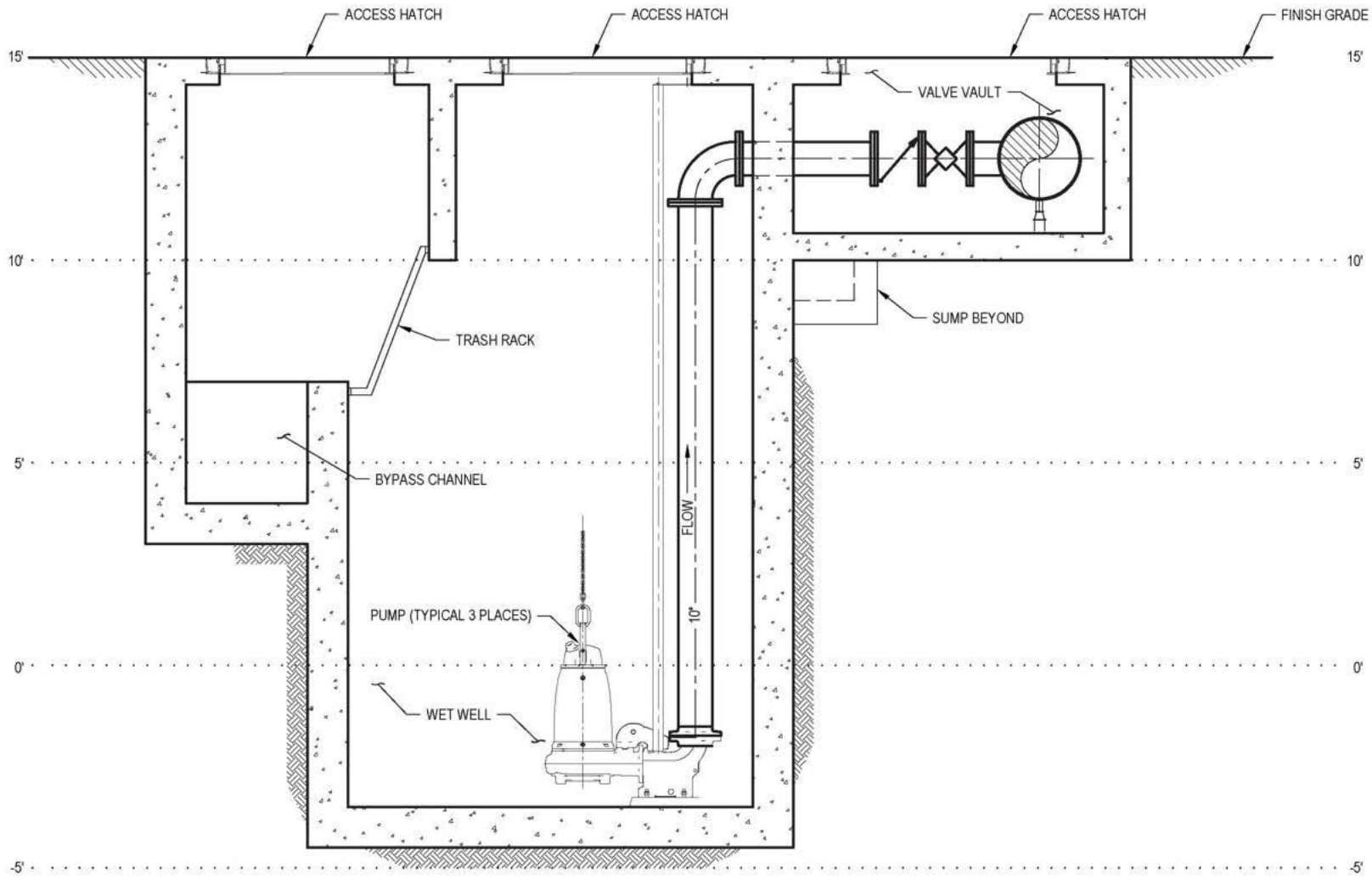
Most of the pump station components would be underground in order to minimize visual impacts to the surrounding community. The underground components would include a 90-cubic-yard concrete vault for the wet well, bypass channel, valve vault, and two new backflow preventers at the existing storm drainpipe outfalls to the channel. The aboveground component would include an 80-square-foot concrete pad with a mounted 150-kilowatt (kW) backup power generator and a mounted motor control center. The backup generator would be powered by biodiesel, if possible, or regular diesel if necessary, and would have a self-contained enclosure with fuel storage. The project would not include storm drain pipeline improvements for flow conveyance to the pump station. The pump station would be designed assuming no upstream restriction of flow conveyance to the wet well. See Figure 2.5-5 and Figure 2.5-6 for details of the belowground pump station components.

Figure 2.5-5 Stormwater Pump Station Plan View



Source: (GHD, 2019)

Figure 2.5-6 Stormwater Pump Station Cross-Section View



Source: (GHD, 2019)

Fish Pools

The project would involve the addition of up to 16 new fish resting pool structures in the concrete channel within Unit 3. The upper 1,900 feet of Unit 3 currently contains 28 small concrete fish pools (4 feet wide and 13 feet long) placed in the center of the stream, spaced approximately 64 feet apart. The new fish pools are intended to provide more efficient resting locations for upstream migrating steelhead and potentially for Coho salmon, which formerly inhabited Corte Madera Creek. The proposed new fish pools would be 1.5 to 3 feet deep and spaced approximately 150 feet apart in the channel. The design of the proposed new fish pools is shown in Figure 2.5-7.

Unit 2

The proposed work within Unit 2 includes the construction of a floodwall on the east side of the existing flood channel adjacent to the College of Marin, and removal of the concrete channel downstream of Stadium Way to restore natural creek function and create tidal and wetland habitat. The Unit 2 project elements are shown on Figure 2.5-3 and Figure 2.5-8.

Floodwall

The floodwall within Unit 2 would be located along the left bank from approximately College Avenue to approximately 200 feet upstream of the Stadium Way pedestrian bridge. The floodwall would be 2 to 4 feet tall, one -foot wide, and approximately 945 feet long, but could extend up to 6 feet high in low lying areas. The floodwall would be built on top of the existing concrete channel wall as a structural extension of the existing structure or set back from the existing wall. The purpose of the floodwall in this section is to avoid increased flood inundation in areas adjacent to Unit 2, including the residential and commercial area between Corte Madera Creek and Sir Francis Drake Boulevard.

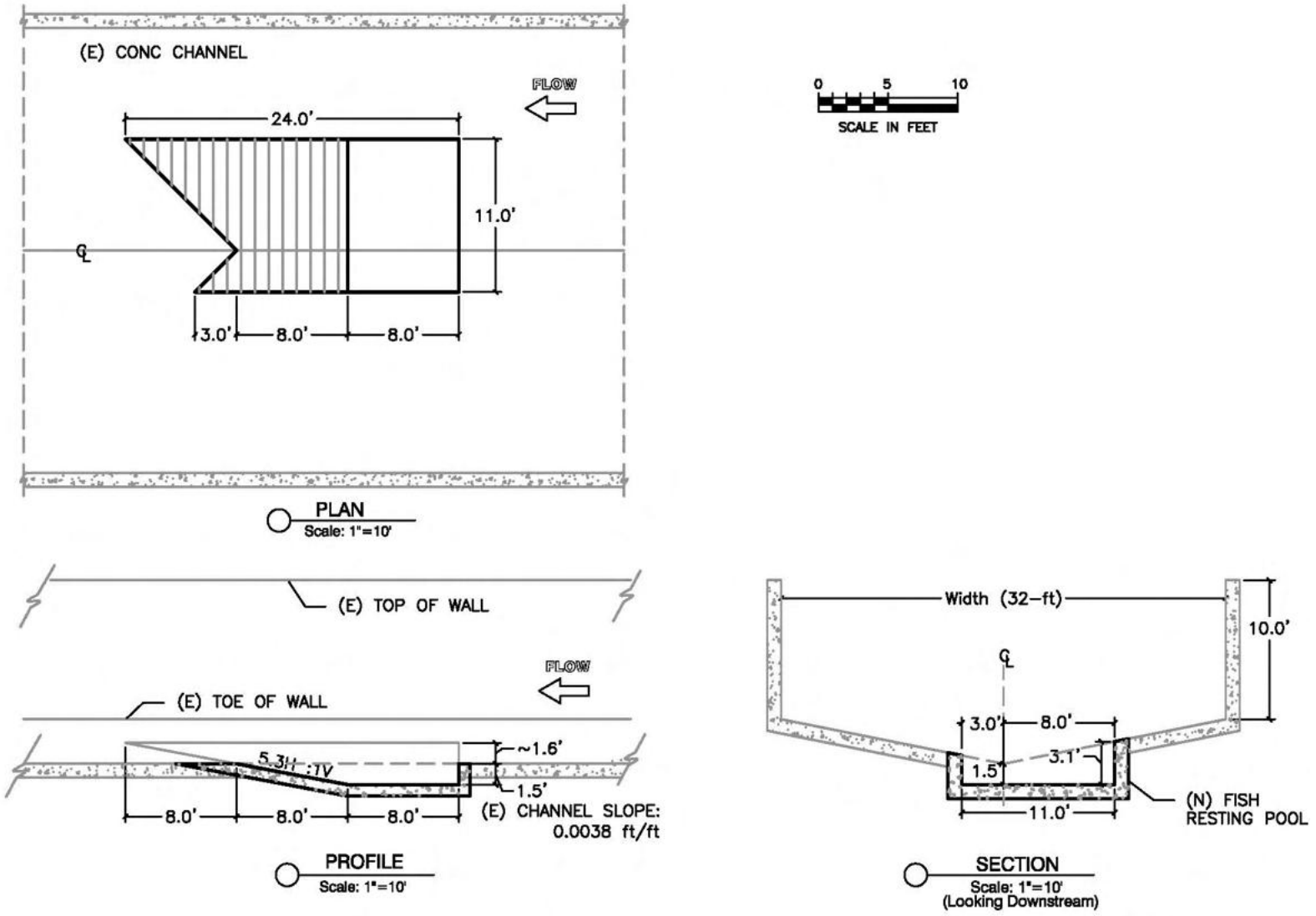
Channel Improvements

The Unit 2 lower College of Marin concrete channel removal would create approximately 0.35 acre of tidal and wetland habitat and 0.46 acre of upland transitional habitat by removing or lowering approximately 625 linear feet of concrete flood channel wall. Habitat created in the earthen channel area would be planted with native vegetation at elevations that would accommodate sea-level rise so that the vegetation and habitat would be resilient to climate change. The habitats that would be created by the lower College of Marin concrete removal are shown on Figure 2.5-8. Rock and fill energy dissipators, a vegetated bioretention basin, and boulder-lined bioswales would be installed within the newly created channel. The new vegetated bioretention basins and bio-swales would be constructed to handle stormwater run-off. The existing concrete storm drains would be removed.

Park and Path Improvements

A vest-pocket park would be created adjacent to the existing multi-use path. The upland habitat around the pocket park would be enhanced by planting native understory vegetation beneath the existing trees. The existing trees in the area would be preserved.

Figure 2.5-7 Proposed Fish Pool Design



Source: (Mike Love & Associates and Jeff Anderson & Associates, 2007)

Figure 2.5-8 Lower College of Marin Concrete Channel Removal Habitat Creation



Sources: (Prunuske Chatham, Inc., 2020; Golden Gate National Parks Conservancy, 2018; Tele Atlas North America, Inc., 2020)

2.6 Project Construction

2.6.1 Summary of Temporary Work Area and Permanent Modifications

Project construction would require temporary work areas and would result in permanent modifications along the Corte Madera Creek channel. The temporary work area for each construction activity is identified in Table 2.6-1. Temporary work areas are shown on Figure 2.6-1.

Table 2.6-1 Temporary Work Area and Permanent Modifications by Element

Unit	Element	Temporary (sf)	Permanent (sf)	Total (sf)
Unit 4	Fish ladder removal and Unit 4 grading	6,375	3,625	10,000
Unit 3	Frederick Allen Park	0	60,000 [a]	60,000
	Fish pools	0	5,000	5,000
	Floodwall (segment #3)	5,400	1,100	6,500
	Stormwater pump station	1,380	520	1,900
	Floodwall (segment #2)	325	65	390
Unit 2	Floodwall (segment #1)	4,750	950	5,700
	Lower College of Marin concrete channel removal	0	86,250 [a, b]	86,250
N/A	Staging areas	52,700	0	52,700
	Total	**70,930**	**157,510**	**228,440**

Notes:

sf = square feet

[a] Total work area from concrete removal in Unit 2 and Frederick Allen Park are counted as permanent modification where the concrete channel will be replaced with wetland and riparian habitats.

[b] Based on the 65 percent design plan the area of permanent modifications may be smaller.

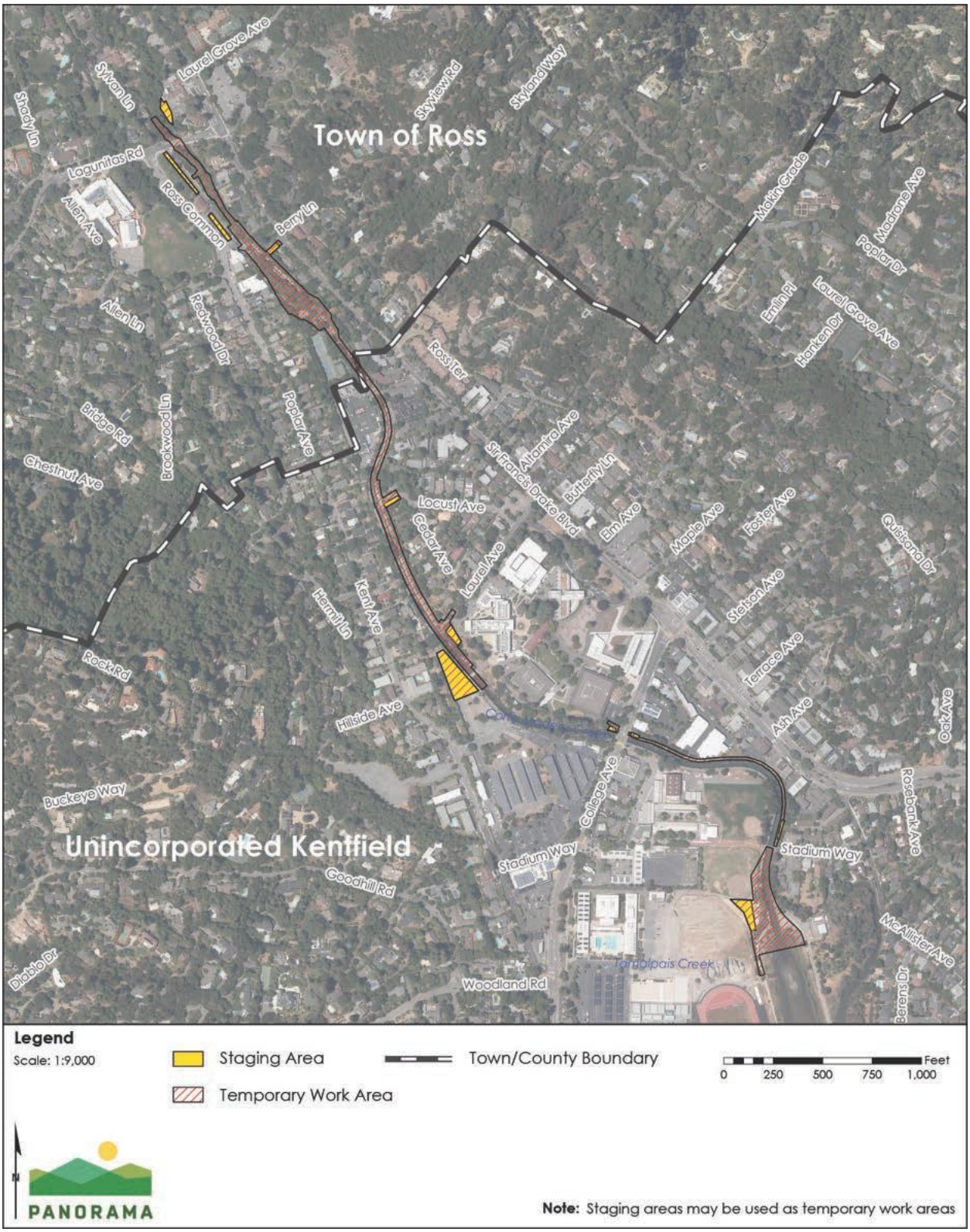
Source: (GHD, 2020b; geomorphDESIGN, 2020)

2.6.2 Site Preparation

Staging and Stockpiling

Proposed staging and stockpiling areas are shown on Figure 2.6-1 and have been limited to properties owned by or easements granted to the District as well as some properties owned by the Town or Ross or College of Marin. In addition to defined staging and stockpiling areas, project work areas could be used for staging, stockpiling, and storage as needed. Vegetation within the staging and stockpiling areas would be trimmed and removed, and the limits of the work area would be fenced at the start of construction. The contractor may lay aggregate base in unpaved staging areas if needed for stabilization. Any imported aggregate base would be removed at the completion of project staging and stockpiling activities.

Figure 2.6-1 Staging, Stockpile, and Temporary Work Areas



Sources: (GHD, 2020d; Golden Gate National Parks Conservancy, 2018; Tele Atlas North America, Inc., 2019)

Vegetation Removal and Fencing

Each construction phase would begin with site preparation activities, which would include vegetation removal, tree removal, and fencing the construction site. Vegetation and trees within the project work areas would be removed to avoid conflicts between existing vegetation and proposed project elements. The maximum number of trees that would be removed during construction from Units 4, 3, and 2 are listed in Table 2.6-2 and shown on Figure 2.6-2 through Figure 2.6-5. Refer to Appendix B for details on the trees proposed for removal including information on species, size, health, and whether the tree is classified as protected, significant, or heritage by local regulations for each tree that would be removed in each project area. The maximum estimate of tree removal includes all trees that may be removed to address Section 408 requirements for a 15-foot setback from floodwalls. The actual number of trees that would be removed along the proposed floodwalls in Segments 2 and 3 would be determined during the Section 408 authorization process and may be substantially less than the maximum estimate included in the table and figures below. USACE could require removal of any trees located within 15 feet of the existing floodwall based on USACE guidance. The trees located within 15 feet of the existing floodwall are shown as a separate category of tree removal on Figure 2.6-2 through Figure 2.6-5 to indicate that some trees could need to be removed under existing conditions. The figures show all trees within 15 feet of the existing concrete channel, including those that are not proposed for removal by the proposed project.

Table 2.6-2 Tree Removal by Unit

Unit	Element	Number of Trees to be Removed[a]
Unit 4	Fish ladder removal and Unit 4 grading	21
Unit 3	Frederick Allen Park [b]	144
	Fish pools	0
	Floodwall (segment #2)	3
	Floodwall (segment #3)	83
	Stormwater pump station	8
Unit 2	Floodwall (segment #1)	71
	Lower College of Marin concrete channel removal	39

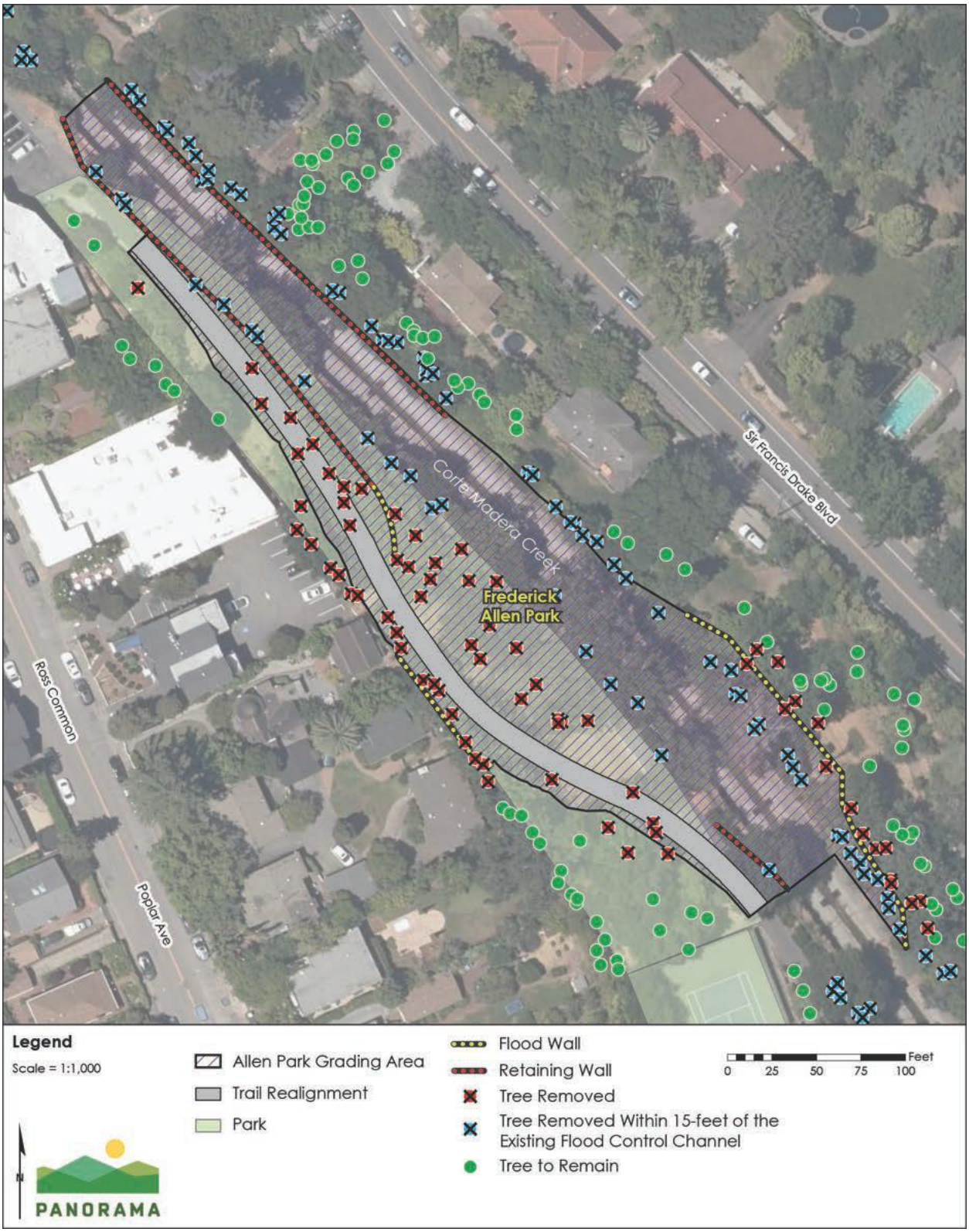
Notes

[a] Of the trees proposed for removal, 184 trees would need to be removed if the USACE requires a 15-foot setback from the existing channel including 18 trees from Unit 4, 71 trees from Frederick Allen Park, 88 trees from the floodwalls, 6 trees from the Stormwater pump station, and 1 tree from the Lower College of Marin concrete channel removal.

[b] 144 trees would need to be removed for Frederick Allen Park grading if the USACE requires a 15-foot setback from the new floodwalls. 113 trees would be removed if a setback is not required. It is the District's intention to apply for a variance to the 15-foot vegetation buffer along the floodwall, which will be approved at the discretion of the USACE.

Source: (GHD, 2020c)

Figure 2.6-2 Tree Removal Unit 4 and Frederick Allen Park



Sources: (GHD, 2020e; Golden Gate National Parks Conservancy, 2018)

Figure 2.6-3 Tree Removal Unit 3



Sources: (GHD, 2020e; Golden Gate National Parks Conservancy, 2018)

Figure 2.6-4 Tree Removal Unit 2



Sources: (GHD, 2020e; Golden Gate National Parks Conservancy, 2018)

Figure 2.6-5 Tree Removal Lower College of Marin Concrete Channel Removal Unit 2



Sources: (Golden Gate National Parks Conservancy, 2018; geomorphDESIGN, 2020)

Following removal of vegetation from construction sites, temporary construction fencing would be installed to secure the site. Temporary construction fencing would consist of chain link or cyclone fencing or other similar fencing material. Any existing fence material that occurs in the work sites, such as along the top of the concrete channel wall, would be removed from the channel wall and hauled off site for disposal at a properly permitted landfill.

2.6.3 Diversion and Dewatering

Work within the creek channel would require creek diversion and fish rescue and relocation. Work within areas of shallow groundwater will require dewatering.

Channel Dewatering and Diversion

Dewatering of the channel can be accomplished either by dewatering the entire reach where work will be performed or localized dewatering at each work area. Dewatering of the entire reach can be accomplished by installing a temporary dam at the upstream end of the Unit 4 improvements and diverting the channel flow around the entire work area. The temporary dam would consist of sandbags or another structure with an impermeable outside lining. A screened pump or gravity intake pipe would be installed above the temporary dam and would be used to divert water around the work area in a flexible pipe that would discharge into the channel downstream of the work area and downstream dam. A similar technique can be used to provide localized dewatering by placing the temporary dam upstream of the work area and discharging the diverted water into the channel downstream of the work area.

There are several storm drain outfalls into the channel along the work area. These outfalls can be connected to the diversion pipe to bypass any discharge from them around the work area. Water that is discharged from the diversion pipe would flow in the channel until it reaches either a downstream tidal barrier dam or the Unit 2 work area. A temporary dam and pump would need to be installed upstream of the Unit 2 work area (upstream of the Tamalpais/Murphy culverts) to capture the diverted channel flow from upstream and pump it around the work area into the earthen channel downstream of the temporary sheet pile dam that will be in place to protect the Unit 2 work area from tidal inundation. If the Unit 2 construction is conducted after 2022, temporary sheet piling would not be installed in Unit 2 for the instream work in Unit 3. In the absence of a temporary sheet pile wall in Unit 2, a super sack[4] dam could be installed at the lower limits of instream work for the fish pool construction to restrict tidal influence from the work area. Access to construct the floodwalls in Unit 2 would be from land and would not require dewatering of the channel.

[4] Super sacks are large bags filled with sand or gravel that are used to construct a temporary cofferdam and dewater work areas.

The sheet pile wall for dewatering in lower Unit 2 will be installed using a silent piler[5]. A biologist with proper USFWS and CDFW qualifications and permits would be retained to monitor dewatering operations and channel being dewatered for the presence of aquatic species. If aquatic species are present, the biologist would relocate the species to a designated relocation area in accordance with federal and state permit requirements and approved Fish Capture and Relocation Plan. At a minimum, a block net would be installed at the upper end of the intertidal reach of the creek to allow for separation of freshwater fish from estuarine fish species. Fish would be relocated into appropriate habitat depending on their location at the time of capture.

Groundwater Dewatering

Groundwater dewatering would be completed using sumps for groundwater collection and submersible pumps within the sumps to pump the groundwater around the work areas. Temporary localized groundwater dewatering would be installed around the exterior portions of the excavated work area at the fish pools. A groundwater diversion box plate with walls made of fiberglass, steel, concrete, or other material would be installed to limit the groundwater in the work area to flow only through the exterior portions of the excavated area. Groundwater would be discharged into upland areas or storage tanks in accordance with federal and state water quality regulations and permit requirements.

2.6.4 Grading

Project construction would require grading within the Corte Madera Creek channel and Frederick Allen Park. Areas of channel lowering (Unit 4) and concrete channel removal would be excavated (cut). In addition to earthen fill in some locations, rock placement would be needed for channel stability and to protect utilities. Concrete would be used for the short floodwalls, for retaining walls, and to seal the excavated fish pools. Excavation and fill quantities for each project element are identified in Table 2.6-3.

[5] A silent piler uses a hydraulic press to install piles into the ground using static energy in order to minimize noise and vibration.

Table 2.6-3 Estimated Cut and Fill Volumes

Unit	Element	Total Volume Cut Generated (cy)	Total Volume Fill - Native Soil (cy)	Total Volume Fill - Rock (cy)	Total Volume Fill - Concrete (cy)
Unit 4	Fish ladder removal and Unit 4 grading	1,500	750	450	225
Unit 3	Frederick Allen Park	8,900	1,350	0	650
	Fish pools	650	0	100	350
	Floodwall (segment #3)	420	160	80	180
	Stormwater pump station	2,800	1,400	20	110
	Floodwall (segment #2)	25	10	5	11
Unit 2	Floodwall (segment #1)	370	150	70	160
	Lower College of Marin concrete channel removal	7,250 [a]	0	1,025 [b]	0
	Total	**21,915**	**3,820**	**1,750**	**1,686**

Notes:

cy = cubic yard

[a] The volume of cut generated is the net cut and includes the volume of rock that would be used as fill.

[b] ,

[c] All rock that would be used in lower channel concrete removal currently occurs in the area and would be reused in the construction process.

Source: (GHD, 2020b; geomorphDESIGN, 2020)

2.6.5 Floodwalls

Concrete floodwalls would be constructed using a cast-in-place method. The top of existing channel walls would be roughened using hydro-blasting where floodwalls would be constructed to extend the height of existing channel walls. Floodwall forms would be installed along the creek side of the channel using a catwalk along the channel wall. A bucket truck with a boom may also be used to install floodwall forms where vehicle access from across the channel is available via existing bicycle path. The forms, and catwalk if used, would be attached to the channel wall with temporary anchors drilled into the wall that would be removed and holes patched upon completion of the floodwall construction.

After the forms are installed on the creek side of the channel, rebar would be installed by drilling holes into the existing channel and inserting reinforced steel rods into the drilled holes. Forms would be completed by installing the form on the land side of the floodwall.

Concrete would be pumped into the forms using line pumps located at access points at each end of the floodwall. The concrete would be allowed to cure for five days prior to removing the

forms and inspection of the finished floodwall. The catwalk and any other temporary access infrastructure would be removed.

2.6.6 Fish Pools

To construct the fish pool, a rectangular portion of the channel approximately 3 feet wider and 3 feet longer than the overall proposed dimensions of the fish pool concept design (11 feet wide and 24 feet long) would be sawcut and demolished. The existing subgrade would be over-excavated and replaced with large diameter aggregate. An appropriate concrete mix design that allows for placement in a submerged environment to seal the work area would be placed in all areas between the sawcut concrete channel and the diversion box or other areas that experience hydraulic groundwater pressures. A base concrete layer would be placed to create a rectangular-shaped box with coated reinforcing steel to establish a working platform and sealed concrete joints with the existing sawcut concrete channel. The concrete surface would be finished with a very rough textured trowel finish to allow for another layer for finished concrete cap. The final concrete cap would be placed with contoured finish to meet the intended design geometry. The minimum concrete thickness would be three inches to avoid future spalling. Each fish pool would require 14 to 18 cubic yards of concrete. High-strength and long-life joint sealant would be installed to allow for thermal expansion but prevent groundwater intrusion or contamination with channel flows. Finally, the water diversion and pump would be removed and relocated to the next upstream fish pool to repeat this process for all fish pools constructed.

2.6.7 Streambed Stabilization

Some of the project elements require imported rip-rap material for channel stabilization. Existing on-site rip-rap would be used at Unit 2 and to the extent possible at Unit 4. Other channel stabilization measures would be installed in accordance with engineering specifications including planted rock, vegetated soil lifts, fabric, and engineered streambed material. Short cast-in-place concrete walls would also be installed adjacent to existing concrete walls in Unit 4.

2.6.8 Paving

The relocated and realigned pathway through Frederick Allen Park would be paved using aggregate base overtopped with asphalt concrete. Typical paving equipment would be used, including dump trucks, a paver, and compaction rollers to compact the aggregate base and asphalt. Access on the Frederick Allen Park pathway would reopen to the public after construction of the park has been completed.

2.6.9 Vegetation/Planting

All native riparian trees removed within the location of floodwalls and project components in upper Unit 2, Unit 3, and outside of Frederick Allen Park would be replaced within proximity to the removal location. A minimum of 89 trees and up to 125 trees would be planted within Frederick Allen Park. The exact number and location of trees would be determined during the USACE Section 408 review process. Trees would be located along the channel margin to provide shade over the channel after development of the tree canopy. A few mature trees would be planted along the walkway in Frederick Allen Park to provide shade during the

vegetation establishment period. Areas of temporary construction containing grasses and bushes would be reseeded with a native seed mix.

Trees would be removed within lower Unit 2 (downstream of Stadium Way) in order to restore tidal wetland habitat. Trees would be planted in an upland area near the new College of Marin maintenance and operations building. The proposed tree planting areas was previously a baseball field and is now completely bare.

A list of tree species that would be planted within Frederick Allen Park and the lower College of Marin concrete channel removal project area is provided in Table 2.6-4. A planting plan including proposed shrubs and understory vegetation is provided in Appendix B.

Table 2.6-4 Tree Planting List

Common Name	Species Name	Size
Frederick Allen Park		
Big leaf maple	*Acer macrophyllum*	15 gallons
Box elder	*Acer negundo*	15 gallons
White alder	*Alnus rhombifolia*	15 gallons
Western flowering dogwood	*Cornus nuttallii*	8-foot trunk height
Red twig dogwood	*Cornus sericea*	5 gallons
Pacific ninebark	*Physocarpus capitatus*	5 gallons
Coast live oak	*Quercus agrifolia*	36-inch box
Valley oak	*Quercus lobata*	24-inch box
Coyote willow	*Salix exigua*	Stakes
Pacific willow	*Salix lasiandra*	1 gallon
Arroyo willow	*Salix lasiolepis*	Stakes
Sitka willow	*Salix sitchensis*	Stakes
Bay laurel	*Umbellularia californica*	8-foot trunk height
Lower College of Marin Concrete Channel Removal		
Box elder	*Acer negundo*	Treepot 4 [a]
Buckeye	*Aesculus californicus*	Treepot 4 [a]
Coast live oak	*Quercus agrifolia*	Treepot 4 [a]
Valley oak	*Quercus lobata*	Treepot 4 [a]
Arroyo willow	*Salix lasiolepis*	Cutting

[a] The sizes indicated are minimum size requirements. Treepot 4 is a 4-inch square by 14-inch-deep pot.

Sources: (Prunuske Chatham, Inc., 2020; GHD and Mike Love and Associates, 2020)

2.6.10 Workforce and Equipment

Construction is anticipated to start in April 2022 and would last approximately seven months. The in-channel construction would occur between June 15 and October 15. General construction timeframes and crew size estimated for project implementation are shown in Table 2.6-5. Construction activities would occur on weekdays between the hours of 8:00 a.m. and 5:00 p.m. No nighttime construction activities would occur as part of the project.

Table 2.6-5 Construction Schedule

Unit	Project Element	Estimated Construction Duration and Timing [a]	Estimated Construction Crew Size per Day
Unit 4	Fish ladder removal and Unit 4 grading	55 days; June – August 2022	8
Unit 3	Frederick Allen Park	105 days; June – October 2022	10
	Fish pools	85 days; June – October 2022	8
	Floodwall (segment #3)	75 days; April – July 2022	10
	Stormwater pump station	40 days; April – May 2022	10
	Floodwall (segment #2)	35 days; July – August 2022	10
Unit 2	Floodwall (segment #1)	70 days; April – July 2022	10
	Lower College of Marin concrete channel removal	72 days; August – October [a] December [b] 2022	10

Notes:

[a] Construction durations include planting activities.

[b] Work for the lower College of Marin concrete removal prior to September 1 would be conducted with hand tools only; heavy equipment use would start after September 1 to avoid the Ridgway's rail breeding season.

Source: (GHD, 2020b)

Equipment usage would depend on the individual needs of each project element as well as the discretion of individual contractors. The following presents a list of equipment types that would likely be used during implementation of the project.

- Boom truck/cherry picker
- Baker tanks (for water storage)
- Concrete truck and boom pump
- Concrete saw
- Crane
- Dump trucks
- Drill
- Excavator (small and medium)
- Flatbed trucks
- Generators and air compressors
- Grader
- Jackhammer
- Loader
- Pickup trucks (small and large)
- Pump
- Roller/compactor
- Paver
- Silent piler

2.6.11 Construction Access

Sir Francis Drake Boulevard would provide the main access from U.S. Highway 101 to all of the project work areas. Access along Corte Madera Creek would be provided via existing roads and recreation paths, including the Corte Madera Creek Pathway. An existing Flood Control District easement would be used to access the concrete channel removal area in lower Unit 2. Proposed project access routes are shown on Figure 2.6-6. Construction of the project would involve the temporary closure of Frederick Allen Park, including the bicycle and pedestrian path through Frederick Allen Park, for up to seven months. Where the pathway is closed within Frederick Allen Park, a detour would be established to divert bicyclists onto Kent/Poplar Avenue from the College of Marin parking lot to Ross Common. The tennis courts and pedestrian access to the tennis courts at Frederick Allen Park would remain open throughout the duration of construction. Access along Bike Route 20 through Frederick Allen Park would be restored to the realigned pathway once construction of Frederick Allen Park is complete.

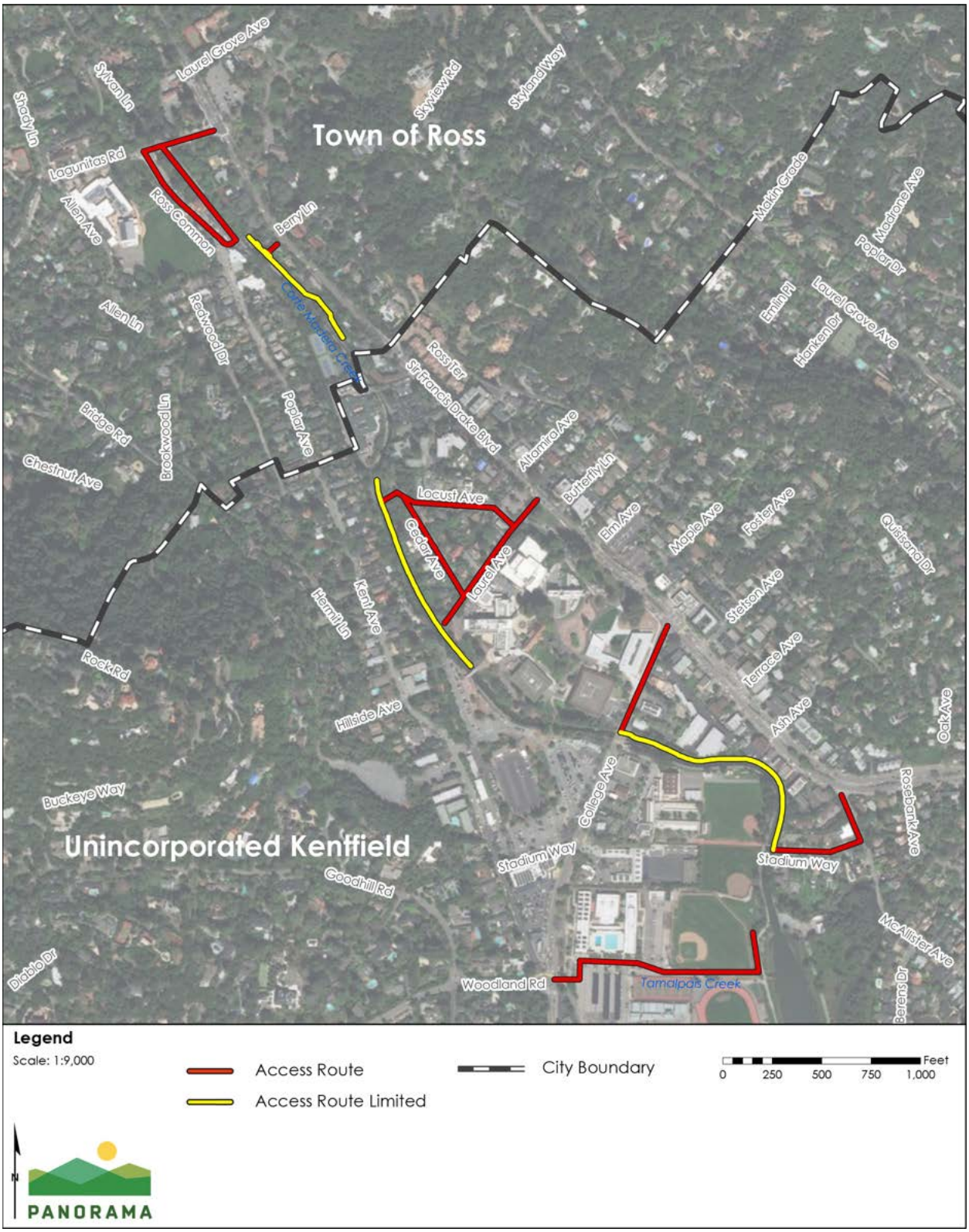
Construction activities could result in temporary lane closure on College Avenue during installation of dewatering infrastructure. Temporary lane closure on College Avenue would last one day each during installation and removal of the cofferdam (two days total). The end of Laurel Avenue, south of Cedar Avenue, may be closed for up to one month during construction of the stormwater pump station.

A new permanent concrete access ramp to the Corte Madera Creek flood control channel is planned for completion in 2021 as a separate project. The ramp would be located within the District's property, at the intersection of Locust Avenue and Cedar Avenue. With the timing of ramp completion scheduled in 2021, it is expected the ramp would be available for vehicular and equipment access into the channel for project construction in 2022 and for future Corte Madera Creek maintenance. The access ramp is not a part of the project, but is discussed in more detail in Section 4.0 Growth-Inducing and Cumulative Effects.

2.6.12 Material Hauling and Vehicle Trips

Table 2.6-6 identifies the truck trips associated with project construction. It is expected that all of the project elements will generate a net excess of excavated material resulting in export from the site for each element. Demolition and total project earthwork would generate approximately 27,000 cubic yards of demolition debris and soil. Of the 22,300 cubic yards of soil that is excavated, approximately 3,800 cubic yards may be beneficially reused in the project as fill material. The excess excavated soil materials (18,500 cubic yards) would be removed from the site. The demolition debris and soil, including the concrete, is anticipated to be recycled at the Marin Resource Recovery Center. After demolition and excavation, materials would be delivered to the project area using dump trucks. Some of the project elements require imported rip-rap material for channel stabilization. Existing on-site riprap will be re-used at Unit 2 and to the extent possible at Unit 4. Imported rip-rap will also be necessary, and potential sources include the following: Lunny Quarry in Nicasio, San Rafael Rock Quarry in San Rafael, Stony Point Quarry in Petaluma, and Syar Quarry in Napa.

Figure 2.6-6 Project Access



Source: (GHD, 2020f)

Table 2.6-6 Project Truck Trip Estimates

Unit	Project Element	Total One-Way Truck Trips	Average Daily One-Way Truck Trips
Unit 4	Fish ladder removal and Unit 4 grading	346	7
Unit 3	Frederick Allen Park	2,002	24
	Fish pools	364	5
	Floodwall (segment #3)	188	3
	Stormwater pump station	290	8
	Floodwall (segment #2)	36	1
Unit 2	Floodwall (segment #1)	170	3
	Lower College of Marin channel concrete removal	1,288	33
	Total	**4,684**	--

Source: (GHD, 2020b)

Fish pool construction and activities at Frederick Allen Park would generate the greatest number of medium- and heavy-duty truck trips of all phases, with up to 93 one-way trips per day. Several phases have overlapping construction time periods that could result in a higher number of peak daily truck trips of up to approximately 417 one-way trips accessing the project area but would average around 28 one-way truck trips throughout the construction period. In addition, worker travel to and from the construction site would account for an average of 18 one-way light vehicle trips per day, with the number of worker trips estimated on the assumption that each worker travels to the project site in their own vehicle. Accounting for overlap of phases, peak one-way worker trips could be up to 92 per day.

2.6.13 Construction Water

Project construction would require water for the purpose of dust control and soil stabilization. Water trucks would apply water to the site as necessary to control dust. Table 2.6-7 identifies the anticipated amount of water that would be required during construction of each project element.

2.7 Project Operation and Maintenance

2.7.1 Operation

The stormwater pump station is the only operable project element that would be installed as part of the project. The stormwater pump station would operate during storm events and would normally be powered through an electrical connection to the grid. A 150-kW generator would provide backup power in the case of electrical failure. Testing and maintenance of the backup generator would occur for up to 50 hours annually.

Table 2.6-1 Construction Water Requirements

Unit	Element	Required Water (gallons)
Unit 4	Fish ladder removal and Unit 4 grading	36,398
Unit 3	Frederick Allen Park	311,982
	Fish pools	12,999
	Floodwall (segment #3)	6,760
	Stormwater pump station	1,976
	Floodwall (segment #2)	203
Unit 2	Floodwall (segment #1)	2,964
	Lower College of Marin channel concrete removal	269,085
	Total	**642,366**

Source: (GHD, 2020b)

2.7.2 Maintenance

Once constructed, the project would require ongoing maintenance activities. Maintenance would be similar to existing District maintenance on Corte Madera Creek; however, the newly constructed habitat would require additional landscape maintenance and vegetation management during the establishment period. Maintenance activities would include the following:

1. Vegetation management
2. Sediment and debris removal
3. Stormwater pump station maintenance
4. Annual floodwall and structure inspection and maintenance

Most maintenance activities would occur during the dry season from April 15 to October 15.

Vegetation Management

Vegetation-management activities are employed to achieve three main goals:

1. Maintain channel flow capacity.
2. Reduce fire fuels.
3. Restore creek habitat by removing invasive nonnative plants and revegetating with native plants.

Vegetation management activities would not include ground-disturbing activities. These activities employ vegetation control methods such as cutting and removing invasive vegetation above the ground by hand or with loppers, hand saws, chainsaws, pole saws, weed eaters, and other hand tools. Removal of nonnative vegetation, tree removal, and thinning employ a mix of

tools including chainsaws, loppers, hand saws, pole saws, hedge trimmers, and other hand tools.

Lower College of Marin Concrete Channel Removal

The lower College of Marin concrete channel removal and restoration is being designed to be a natural, self-maintaining creek ecosystem, resilient to sea-level rise and climate change. No routine maintenance is anticipated. In the event unforeseen maintenance is required, such as to address storm flow debris, washed up boats, or other man-made debris in the area that affects the natural function of the habitat or flood conveyance capacity, the District would remove the debris.

Sediment and Debris Removal from Fish Pools

Timely removal of debris from fish pools is necessary to avoid or minimize any delay in fish migration that would typically be associated with rainfall-runoff events. Debris (woody debris or urban debris) within the fish pools would be removed by a hand crew if it were large enough to be disrupting flow patterns within the pool in such a way that could reduce resting areas or cause sedimentation. It is anticipated that debris removal would occur approximately once per year but could be more frequent depending on observed conditions. Debris removal would take place as soon as flows recede to a safe level between storm events.

Accumulated sediment would also be removed from the fish pools if the amount of sediment is affecting their intended functioning. Sediment would be removed using a Vactor truck that would access the channel via the permanent access ramp scheduled for completion in 2021. Alternatively, sediment could be removed by a hand crew. Sediment removal would occur on an as-needed basis.

Stormwater Pump Station

During the dry season, the pump station would be inspected once a month. Routine maintenance would be performed annually on the motors and generator. Debris collected in the wet well and outlet structure would be removed, and the facilities would be cleaned with a Vactor truck at least once every wet season. Annual tests would be conducted on the electrical and mechanical systems. Load bank tests would be performed on the generators every three years, and periodic maintenance would be performed on the pump systems every six years.

Floodwall Inspections and Maintenance

Floodwalls would be maintained in accordance with the USACE Interim Operation and Maintenance Manual for Units 1 through 3. Visual floodwall inspections would be conducted just before the beginning of the flood season, immediately after each major high-water period, and at intervals not exceeding 90 days. In addition, inspections are to be made after every earthquake that occurs within 200 miles and has a Richter magnitude of 5 or above. Inspections would also be required after smaller earthquakes if specific reports of damage are received. Eroded concrete would be repaired when reinforcing steel is exposed or erosion approaches 2 inches in depth. Normally, eroded concrete is repaired by sandblasting the eroded area and filling with Portland cement mortar. The channel walls would be maintained and cleaned as necessary, removing all barnacles and any other matter that may deteriorate the channel.

2.8 Permits and Approvals

The project will require permits and approvals from federal, state and local agencies. The anticipated permits and approvals needed for implementation of the project are listed in Table 2.8-1.

Table 2.8-1 Required Permits or Approvals for the Project

Agency	Approval or Permit
Federal	
U.S. Army Corps of Engineers	Clean Water Act Section 404 Permits Clean Water Act Section 408 Permit
U.S. Fish and Wildlife Service	Section 7 Consultation
National Marine Fisheries Service	Endangered Species Act (ESA) Section 7 Biological Opinion
Federal Emergency Management Agency	Conditional Letter of Map Revision
State	
State Office of Historic Preservation	National Historic Preservation Act Section 106 Consultation
California Department of Fish and Wildlife	Fish and Game Code Section 1602 Lake and Streambed Alteration Agreement
San Francisco Bay Regional Water Quality Control Board	NPDES Construction Stormwater Permit Clean Water Act Section 401 Water Quality Certification
State Lands Commission	Lease agreement for work within State Lands jurisdiction
Local	
Marin County Flood Control and Water Conservation District	Lead local agency (CEQA)
Town of Ross	Tree permit Easement for construction and maintenance within Frederick Allen Park (Town of Ross property)
College of Marin	Potential easement modification for work within College of Marin property

2.9 Distinction Between Review of Environmental Issues and Project Merits

Often during review of an EIR, the public raises issues that relate to the attributes or wisdom of the project or issues such as the project's community benefits or community consequences (referred to here as "project merits") rather than the scope or substance of the environmental analyses in the EIR. Lead Agency review of environmental issues and project merits are both important in the decision of what action to take on a project, and both are considered in the

decision-making process for a project. However, a Lead Agency in its CEQA review is required only to address environmental issues that are raised. Certifying an EIR (i.e., finding that it was completed in compliance with CEQA) and taking action on the project are procedurally distinct processes and result in separate decisions made by the Lead Agency. Nonetheless, the EIR must be certified by the Lead Agency before the Lead Agency can take approval actions on the project.

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3 Environmental Setting, Impacts, and Mitigation Measures

3.0 Introduction

3.0.1 Scope of Analysis

This chapter contains an analysis of the environmental topics identified by the District's scoping process for the Environmental Impact Report (EIR) (Notice of Preparation [NOP] and Scoping Meetings) described in Chapter 1. Environmental topics addressed in this chapter include:

- Aesthetics and Visual Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Noise
- Public Services
- Recreation
- Transportation and Circulation
- Tribal Cultural Resources
- Utilities and Service Systems
- Agriculture and Forestry Resources, Land Use and Planning, Mineral Resources, Population and Housing, Socioeconomics, and Wildfire

Sections 3.1 through 3.16 of this chapter describe existing environmental conditions as they relate to each specific topic, identify significant adverse environmental effects (significant impacts) from implementing the project, and present mitigation measures to avoid or substantially lessen significant impacts to a less-than-significant level. Growth-inducing and cumulative impacts are discussed in Chapter 4. Alternatives to the project are described and analyzed, and their impacts compared to those of the project in Chapter 5.

3.0.2 Format of Environmental Analysis

Sections 3.1 through 3.16 of this chapter are organized as described below, based on the requirements of California Environmental Quality Act (CEQA).

Scoping Comments

Scoping comments received during the public scoping period for the EIR are included for each applicable resource section. Each comment, along with the location where each comment is addressed in the respective resource analysis, is summarized in a table. If scoping comments are not applicable to the resource topic, it is stated that no scoping comments apply.

Environmental and Regulatory Setting

Existing conditions are described in the respective "setting" sections for each environmental resource topic. The existing baseline conditions are described as of the date the NOP was published. These descriptions summarize information compiled during the study process to prepare the EIR. In the case of Hydrology, a future condition is also considered because changes to the hydrologic setting would occur prior to project construction and implementation as a result of upstream flood-control projects that have been approved but have not yet been constructed. Future changes in the hydrologic setting would also result from sea level rise. Background materials used in the EIR are referenced at the end of each section. The setting includes both the physical setting and the regulatory setting (that is, applicable local, State, and federal laws and regulations) that pertain to each resource topic.

Impact Assessment Methodology

Significance Criteria

Each resource topic in this EIR includes a definition of the significance criteria used to perform the analysis. This EIR uses the significance criteria adopted from the latest Appendix G of the CEQA Guidelines. The CEQA Guidelines significance criteria are supplemented with local thresholds of significance from Appendices K and N of the Marin County's Environmental Impact Review Guidelines. In each instance, the discussion cites the source of the identified threshold. The significance threshold used in this EIR account for amendments to CEQA Guidelines Appendix G, as adopted by the California Natural Resources Agency on December 28, 2018.

Approach to Analysis

This section describes any methodologies used to prepare the impact assessment, including modeling or standards utilized to assess impacts where specific technical methods were applied.

Impact Discussion

Impacts

The analysis under each impact statement includes an evaluation of the significance of environmental impacts resulting from construction, operation, and maintenance of the project. An impact conclusion is provided for the analysis of each criteria question. The analysis considers both short-term and long-term impacts as well as direct and indirect impacts resulting from the project. Indirect impacts from a project may occur later in time, at a different location, or as the result of a sequence of related interactions (State CEQA Guidelines Section 15064[d][2] and [3]).

Levels of Significance and Significance Determination

The following are definitions of the impact determinations used in the impact discussion:

- **Significant and Unavoidable.** This determination applies if the project would result in an adverse effect that would exceed the significance criteria and for which

there is no feasible mitigation available to reduce the impact to a less-than-significant level.

- **Less than Significant with Mitigation.** This determination applies if there is a potential for the project to result in an adverse effect that would meet or exceed the significance criteria, but feasible mitigation is available that would reduce the impact to a less-than-significant level.
- **Less than Significant.** This determination applies if there is a potential for some limited impact but not a substantial, adverse effect that qualifies under the significance criteria as a significant impact. No mitigation is required for impacts determined to be less than significant.
- **No Impact.** An impact issue is considered not applicable (no impact) if there is no potential for impacts or the environmental resource does not occur within the project area or the area of potential effect.

Mitigation Measures

Each impact subsection identifies mitigation measures for all of the impacts considered significant, consistent with CEQA Guidelines Section 15126.4, which states that an EIR "shall describe feasible measures which could minimize significant adverse impacts…." In this EIR, mitigation measures are identified (where feasible) for all of the significant impacts, and residual effects after mitigation are noted. If additional impacts could result from implementation of a mitigation measure, those impacts are identified, consistent with CEQA Guidelines Section 15126.4.[1]

3.0.3 Approach to Cumulative Impact Analysis

Cumulative impacts, as defined in CEQA Guidelines Section 15355, refer to two or more individual effects that, when taken together, are "considerable" or that compound or increase other environmental impacts. A cumulative impact from several projects is the change in the environment that would result from the incremental impact of each project when added to those of other closely related past, present, or probable future projects.

CEQA Guidelines Section 15130(b) presents two approaches for analyzing cumulative impacts:

- A list of past, present, and probable future projects producing related or cumulative impacts, including those projects outside the control of the agency; or
- A summary of projections contained in an adopted local, regional, or statewide plan or related planning document that describes or evaluates conditions contributing to the cumulative effect. Such plans may include a general plan, regional transportation plan, or plans for the reduction of GHG emissions. A

[1] CEQA Guidelines Section 15126.4 states that "if a mitigation measure would cause one or more significant effects in addition to those that would be caused by the project as proposed, the effects of the mitigation measure shall be discussed but in less detail than the significant effects of the project as proposed."

summary of projections may also be contained in an adopted or certified prior environmental document for such a plan. Such projections may be supplemented with additional information such as a regional modeling program.

The cumulative impact analysis considers the effects of the project together with those of other past, present, or probable future projects within the geographic scope of cumulative analysis applicable to each resource topic. Refer to Section 4.3 Cumulative Impacts for a more detailed description of the approach to the cumulative impact analysis found in this EIR.

3.1 Aesthetics and Visual Resources

3.1.1 Introduction

This section includes an evaluation of the potential for the project to adversely impact aesthetic and visual resources in the project area. This section provides an overview of the environmental and regulatory setting that applies to aesthetic and visual resources within the project area and includes a discussion of project impacts and appropriate mitigation measures, where necessary. The aesthetic and visual resources setting and impact analysis are based on field observations, aerial and ground-level photographs, and visual simulations.

3.1.2 Scoping Comments

Comments related to aesthetic or visual impacts were received during the public scoping process. These comments and the location where they are addressed in the aesthetics and visual resources analysis are provided in Table 3.1-1.

Table 3.1-1 Aesthetics and Visual Resources Scoping Comments

Agency/Entity	Comment	Location in Aesthetics and Visual Resources Section that Comment is Addressed
Garril Page	Ross' essence and character are defined by the high canopy of its majestic heritage trees. The proposed Frederick Allen Park (FAP) Riparian Corridor as proposed is barren, stark, denuded of natural beauty, and very inhospitable. The proposed man-made shade structures are not in keeping with any aspect of the town and appear to be poor substitutes for the trees that would be removed. The shade structures provide relatively little shade for humans, none for fish in the basin, and are not appropriate, welcoming, nor attractive to gaze upon.	Section 3.1.6, Impact 3.1-2
Garril Page	Tree loss creates emphasizes the proximity of Sir Francis Drakes traffic. This becomes visual pollution for Ross Common. The intrusion will be particularly notable within the proposed FAP Riparian Corridor.	Section 3.1.6, Impact 3.1-2
Julie McMillan	If Frederick Allen Park is used as a flood plain, many trees will be removed, will be bad aesthetically and expensive to add replacement trees	Section 3.1.6, Impact 3.1-2
Charles Goodman	The County must address the removal of over 200 mature trees and how it plans to replace the Park Setting, Privacy, and Habitat Coverage in a timely manner.	Section 3.1.6, Impact 3.1-2

3.1.3 Aesthetic and Visual Concepts

Baseline aesthetic conditions are defined within the context of visual quality and visual sensitivity. For the purpose of this EIR, visual quality and visual sensitivity were defined consistent with the Federal Highway Administration (FHWA) Guidelines for the Visual Impact Assessment of Highway Projects ((Federal Highway Administration, 2015). While the project is not a highway project, the FHWA guidance was used to evaluate overall baseline visual quality in the project area because Marin County has not developed their own guidance for evaluating visual quality and the FHWA guidance was developed to address visual impacts in urban environments, similar to the visual environment of the proposed project.

Visual Quality

The baseline visual quality of a scene is used to evaluate the degree of visual change and impact. A viewer observing an existing scene has a range of available responses that are inherent to all human beings. The FHWA guidelines recognize three types of visual perception that are used in defining visual quality:

- **Harmony.** When viewing the components of a scene's natural environment, viewers inherently evaluate the natural harmony of the existing scene, determining if the composition is harmonious or inharmonious.
- **Cultural Order.** When viewing the components of the cultural environment, viewers evaluate the scene's cultural order, determining if the composition is orderly or disorderly.
- **Coherence.** When viewing the project environment, viewers evaluate the coherence of the project components, determining if the project's composition is coherent or incoherent.

Viewers have a concept of what constitutes natural harmony, cultural order, and project coherence. The greater degree to which the visual resources of the project meet the viewer's preference concept of natural harmony, cultural order, and project coherence, the higher value the viewer places on those visual resources. The existing visual quality was evaluated as low, moderate, or high, using the criteria of natural harmony, cultural order, and project coherence.

Visual Sensitivity

Visual sensitivity is how concerned viewers are about visual quality. Several factors influence visual sensitivity, including viewer quantity, viewer activity, and distance between project activities and viewers. Viewer sensitivity is higher in areas that are resting points and areas with higher numbers of viewers (e.g., Frederick Allen Park and Bike Route 20) than viewer sensitivity in areas that are viewed less frequently (e.g., Corte Madera Creek along Unit 4).

Factors that influence visual sensitivity include:

- **Degree to which change is apparent in the landscape:** Certain landscapes are naturally more able to undergo changes without the changes being noticeable. A dense forest may, for example, mask aesthetic changes that take place deep in the forest.

- **Proximity:** The further away a scene or object is from a viewer, the less exposure that viewer has-or conversely, the closer the viewer is to an object or scene, the more exposure the viewer has. Changes in the view are more perceptible and more sensitive at closer distances. Proximity is measured in the following distance zones (Litton, 1968):
  - **Foreground:** Up to 0.5 mile from the viewer
  - **Middleground:** Extends from the foreground zone to approximately 3 to 5 miles from the viewer
  - **Background:** Extends from the middleground zone to the limit of visibility
- **Viewer attention:** Activities that are within the viewer's focus are more apparent than those that are outside of or at the edge of a viewer's focus.
- **Extent:** Refers to the number of people that will be viewing the scene or object. Fewer viewers means less exposure; many viewers means greater exposure. Areas with greater numbers of viewers will be more sensitive to change than areas with fewer viewers.
- **Duration**: Measures how long viewers view the scene or object. The narrower the view and the faster one travels, the shorter the duration. The wider the view and the more one lingers, the longer the duration and the more viewer exposure. The shorter the duration of view, the less sensitive the viewer is to change.

3.1.4 Environmental Setting

Regional Setting

The project is in central Marin County, which is part of the larger San Francisco Bay Area (Bay Area). The San Francisco Bay region is in the Coast Ranges Physiographic Province, which spans 400 miles in California from Humboldt County to Santa Barbara County. The Bay Area is characterized as having a Mediterranean climate, with Coast Redwood forest and chaparral and woodlands. The Bay Area is highly developed; however, substantial tracts of open space contribute to the visual character of the region.

Marin County has a unique visual environment with a diversity of landscapes that includes views of open space, ocean vistas and beaches, San Francisco Bay shoreline, hills and ridgelines, agricultural lands, stands of forests, and other natural features. The majority of the undeveloped land is found in the northern and western areas of the county. Nearly half of the county's land is protected by park or open-space status. In the southern portion of the county, long-distance views are often dominated by Mount Tamalpais.

Urban development in Marin County is essentially concentrated along the U.S. Highway 101 corridor in the eastern third of the county from Novato in the north, San Rafael in the central portion, and Sausalito/Marin City in the south, punctuated by the Golden Gate Bridge at its southern tip. Aside from the larger cities of San Rafael and Novato, urban development in Marin County is centered on well-established villages and towns in the many valleys on the northern and eastern flanks of Mount Tamalpais. The project area is located in unincorporated

Kentfield and the Town of Ross and within the City-Centered Corridor, along Highway 101, as identified in the Marin Countywide Plan. The corridor is primarily designated for urban development and for protection of environmental resources. The surrounding ridgetops and upper slopes of the watershed are generally wooded and undeveloped whereas the valley floor, where the project is located, is densely developed. The communities surrounding the project site have maintained a small town feel that blends with the surrounding natural and agricultural landscapes. Most of the smaller municipalities in Marin County have adopted land-use controls that encourage residential development near town centers, which lends to walkable neighborhoods, maintaining a pedestrian-scale community. As noted below, the Town of Ross has a particular visual character maintained by its own building-design requirements. County and local ordinances have also protected nearby ridgelines and scenic vistas.

Project Setting

Visual Character

The viewshed of the project area within Corte Madera Creek and Frederick Allen Park is limited to those areas immediately adjacent to Corte Madera Creek and within Frederick Allen Park. The Corte Madera Creek channel is set below grade. Residential development and dense vegetation and trees along College of Marin campus border the creek and block views of the subsurface flood control channel from areas northeast of the creek, with the exception of views from areas immediately adjacent to the creek and at creek overpasses. Bike Route 20 and residential development, Frederick Allen Park, commercial development, and a parking lot border Corte Madera Creek and the project area. Views of the project area from areas west of the creek are limited to Bike Route 20, areas within Frederick Allen Park, and the parking lot at the Town of Ross Post Office due to the density of surrounding residential and commercial development.

The viewshed of the areas surrounding the project area within the Town of Ross and Kentfield is framed by Southern Heights Ridge on the north and east, which physically and visually separates Ross Valley from San Rafael, while Mount Tamalpais forms the visually-defining ridge on the south and west of Ross Valley. Much of the land area on the Mount Tamalpais ridgeline is preserved as open space, as Marin County Open Space lands and the Marin Municipal Water District (MMWD) watershed lands. Ridgeland and upland greenbelt areas are located within the Town of Ross and Kentfield boundaries, and the Bald Hill Open Space Preserve and Baltimore Canyon Open Space Preserve are west of the Town of Ross and Kentfield areas, respectively. Corte Madera Creek parallels Sir Francis Drake Boulevard, and the creek flows south within the project area towards Corte Madera and the San Francisco Bay.

Representative photographs of the project area were taken to characterize the visual setting of Corte Madera Creek and the immediate surroundings. Representative photo locations are provided on Figure 3.1-1. Representative photos of the project area are shown on Figure 3.1-2 through Figure 3.1-10. Photos were taken on July 28, 2020, between 10 am and 12 pm. All photographs presented in this section have an approximately 40-degree horizontal angle of view, which is roughly equivalent to a 35-millimeter film camera with a 50-millimeter lens. This

configuration is intended to represent an approximate human field of vision and viewing scale. Photographs were taken at eye level.

Town of Ross (Units 4 and 3)

The Town of Ross is between the Town of San Anselmo to the north and the Kentfield to the south and is framed by generally continuous ridgelines to the north and south. The Town of Ross is a quiet residential community with tree-lined, shady streets with wooded ravines, open grassy areas, and long avenues of large shade trees. The Town's development pattern is similar to that of the other Ross Valley communities, with development on the valley floor and residential development extending up the adjacent hillsides.

Within Unit 4, Corte Madera Creek has natural channel characteristics with vegetated banks and a gravel streambed although many human-made features and disturbances are present. Structural elements include concrete bridge abutments and piers at Lagunitas Road Bridge. Bank-retaining structures, including rock gabions, railroad ties, sand concrete bags, and concrete current deflectors are present on the right bank upstream of Lagunitas Road Bridge and the left bank downstream of Lagunitas Road Bridge. Unit 4 has a relatively undisturbed appearance (compared to Units 3 and 2) characterized by predominantly native riparian vegetation and native material streambed. Trees form a dense canopy that couple with abundant understory vegetation to produce a calm and visually pleasing environment in the creek. The scenic integrity of this section of the creek is somewhat disrupted by the presence of Lagunitas Road Bridge, resident-constructed floodwalls and gabion structures, the Ross Town Hall upstream of the Lagunitas Road Bridge, and residences along the left bank between the bridge and fish ladder. Sylvan Lane runs parallel to the creek on the right bank upstream of Lagunitas Road Bridge. Sylvan Lane is quiet, narrow, wooded, and aesthetically pleasing.

Downstream of Lagunitas Road Bridge, bank stabilization and retaining structures are visible on the left bank below the upper bank terrace. The bank-retaining structures are visible from public areas, including public parking lots and Bike Route 20 on the top of the right bank. The bank retaining structures are not visible from the residences above the retaining structures.

Despite the presence of human modifications in Unit 4 of the creek, Unit 4 is regarded as having moderate visual quality due to moderate harmony, orderliness, and coherence along the natural creek channel. Views of the creek are easily accessible from Lagunitas Road Bridge, the Post Office, Ross Town Hall, Bike Route 20, and Frederick Allen Park along the right bank. Representative photographs were taken from areas within Unit 4 to demonstrate the visual conditions in the area. A representative photograph of Unit 4 is provided in Figure 3.1-2.

Upper Unit 3 within the Town of Ross is characterized by a trapezoidal concrete-lined drainage channel, extending downstream from the southern end of the Town of Ross Post Office parking lot adjacent to the existing fish ladder to the Kentfield Hospital. The concrete channel has vertical walls and a V-shaped channel bottom. The channel consists of long straight sections, several subtle bends, and three tight curves. Views of the creek in Unit 3 are dominated by the concrete-lined flood control channel and steel fencing that runs atop the walls of the channel.

These views are somewhat softened by vegetation growing along the tops of the channel walls that is quite dense in some locations, especially where the creek borders Frederick Allen Park. The visual quality of Unit 3, specifically north and south of Frederick Allen Park where nearby buildings and residences are visible and the vegetation along the creek and Bike Route 20 is dense, is low-moderate, and of lower visual quality compared to the more natural condition of Unit 4 upstream. Views along Unit 3 are less coherent than Unit 4 because there are intermittent views of vegetation along the fence line and views of the concrete floodwall. Unit 3 is less harmonious than Unit 4 because of the concrete elements of the floodwall and fencing, nearby residences, and adjacent vegetation that are inconsistent with a natural creek environment. Frederick Allen Park is located downstream of the Ross Post Office, adjacent to the creek. Bike Route 20, a bicycle-pedestrian path, travels through the park and along the right bank of the creek through Unit 3. The visual quality of Frederick Allen Park is considered moderate due to the dense vegetation that blocks views of adjacent residences, business, and other development. Vegetation and trees within Frederick Allen Park also soften views of the concrete channel, and the overall views have less human intrusion and are not as modified as the surrounding areas in Unit 3. Representative photographs of upper Unit 3 are provided in Figure 3.1-3 through Figure 3.1-6.

Kentfield Area (Units 3 and 2)

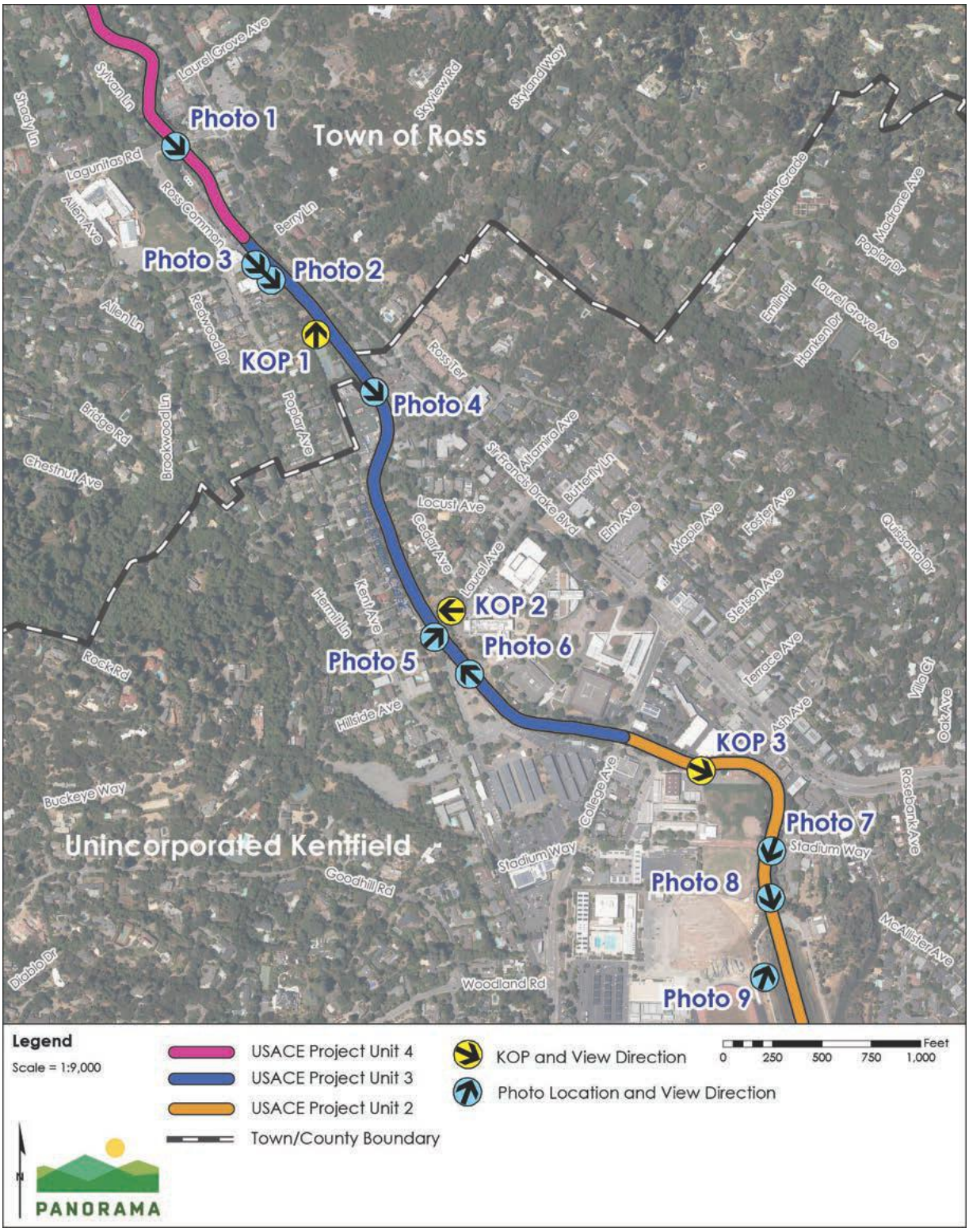
The community of Kentfield borders the Town of Ross to the south. In general, this area shares the same visual and aesthetic characteristics as the Town of Ross and neighboring municipalities. Kentfield shares a similar development pattern as the Town of Ross, with commercial and residential on the valley floor framed by County-designated ridgelines on the north and south.

Lower Unit 3 and Unit 2 within the Kentfield area share similar characteristics as upper Unit 3 within the Town of Ross. Unit 3 extends from Kentfield Hospital downstream to just south of Stadium Avenue. Bike Route 20 continues through Kentfield adjacent to the right bank of the creek, eventually crossing to the left bank at the Stadium Avenue Bridge. An informal unnamed path (unnamed path #1) runs adjacent to the left bank of the creek, between Kentfield Hospital and Laurel Avenue in Unit 3, on the left bank between College Avenue and Stadium Way (unnamed path #2), and south of Stadium Way on the right bank (unnamed path #3) in Unit 2. The overall appearance of the creek in Units 3 and 2 is characterized as highly modified, with low visual quality and low scenic integrity. Representative photographs of lower Unit 3 and Unit 2 are provided in Figure 3.1-7 through Figure 3.1-10.

Scenic Vistas

The ridgelines encompassing the project area provide ample opportunity for scenic vistas from publicly accessible viewpoints into the Town of Ross and Kentfield. Though the development on the valley floor is visually obvious from the viewpoints on both ridges, the visual texture is softened by the relatively even cover of street trees and open space throughout the valley. This allows the visual appearance of the valley floor to gradually transition and blend in with the undeveloped ridgelines with no sharp or abrupt visual contrast. The appearance from publicly accessible viewpoints is visually consistent and lacking sharp visual contrast.

Figure 3.1-1 Representative Photograph and Key Observation Point Location Map



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2012, Golden Gate National Parks Conservancy 2018)

Figure 3.1-2 Photograph 1: View of Unit 4 from Lagunitas Road Bridge, Looking Southeast



Figure 3.1-3 Photograph 2: View of Unit 3, Frederick Allen Park, Looking Southeast



Figure 3.1-4 Photograph 3: View of Unit 3, Frederick Allen Park, Looking Southeast from Marin County Bicycle Route 20



Figure 3.1-5 Photograph 4: View of Upper Unit 3 Fish Pools from Kentfield Hospital Bridge, Looking Southeast



Figure 3.1-6 Photograph 5: View of Unit 3 From Marin County Bicycle Route 20, Looking Northeast at Proposed Pumping Station Location



Figure 3.1-7 Photograph 6: View of Lower Unit 3 from Science-Math-Nursing Building Bridge, Looking Northwest



Figure 3.1-8 Photograph 7: View of Unit 2 from Marin County Bicycle Route 20 near Stadium Way Bridge, Looking South



Figure 3.1-9 Photograph 8: View of Unit 2 from Bike Route 20, Looking South from Left Bank



Figure 3.1-10 Photograph 9: View of Unit 2 from Unnamed Path Adjacent to College of Marin Athletic Fields, Looking Northwest from Right Bank



The General Plans for Ross and Kentfield do not identify designated scenic vistas; however, the Ross General Plan provides polices addressing the protection of scenic vistas. Broad, publicly accessible views of the surrounding mountains and landscape from within the Town of Ross and Kentfield on the valley floor are limited due to intervening development and street trees, which draws the eye downward to street level or blocks middle-ground or background views. There are no designated scenic vistas within the project area.

Scenic Highways and Roadways

No designated State Scenic Highways or County roadways are located within Marin County; however, roadways throughout Marin offer views of the County's and the region's scenic resources. Two segments of Highway 101 in Marin County are eligible for inclusion on the list of State Scenic Highways: the segment opposite San Francisco/State Route 1 in Marin City, approximately 5 miles southeast of the project, and the segment near State Route 37/Ignacio in Novato, approximately 8 miles from the project. Highway 1 in Marin County is also eligible for inclusion on the list of State Scenic Highways and is approximately 4.5 miles from the project area. The project area is not visible from any eligible state scenic highway.

3.1.5 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

Federal Regulations

No federal laws or regulations for aesthetics and visual resources are applicable to the project.

State Regulations

State Scenic Highway Program

California's Scenic Highway Program was created by the Legislature in 1963 to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways. State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq. A highway may be designated as "scenic" based on the expanse of the natural landscape that can be seen by travelers, the scenic quality of that landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. A Scenic Corridor is described as the land generally adjacent to and visible from such a highway and is usually limited by topography and/or jurisdictional boundaries. In addition to State Highways, County roads are also eligible for scenic designation.

Title 24 Outdoor Lighting Standards – Nighttime Sky

The California legislature passed a bill in 2001 requiring the California Energy Commission to adopt energy efficiency standards for outdoor lighting for both the public and private sectors. The California Energy Commission adopted changes to Title 24, parts 1 and 6, Building Energy Efficiency Standards, which included changes to the requirements for outdoor lighting for residential and non-residential development. The standards regulate lighting characteristics, such as maximum power and brightness, shielding, and sensor controls to turn lighting on and off, which could affect nighttime views (California Energy Commission, 2015).

Regional and Local Regulations

Marin County Municipal Code

The following policies and codes of the Marin County Municipal Code related to aesthetics are applicable to the project (Marin County, 2020)

Chapter 22.27 Native Tree Protection and Preservation

Section 22.27.030 Prohibition on Removal of Protected Trees. Protected Trees shall not be removed except in compliance with Section 22.62.040 (Exemptions), and as provided for in Chapter 22.62 (Tree Removal Permits). (Ord. No. 3577, 2012)

Chapter 22.62 Tree Removal Permits

22.62.010 Purpose of Chapter. The purpose of this chapter is to establish regulations for the preservation and protection of native trees in the unincorporated areas of Marin County by limiting tree removal in a manner which allows for reasonable use and enjoyment of such property and to establish a procedure for processing Tree Removal Permits.

Section 22.62.040 Exemptions. The removal of any protected or heritage tree on a lot is exempt from the requirements of this Chapter if it meets at least one of the following criteria for removal:

A. The general health of the tree is so poor due to disease, damage, or age that efforts to ensure its long-term health and survival are unlikely to be successful;
B. The tree is infected by a pathogen or attacked by insects that threaten surrounding trees as determined by an arborist report or other qualified professional;
C. The tree is a potential public health and safety hazard due to the risk of its falling and its structural instability cannot be remedied;
D. The tree is a public nuisance by causing damage to improvements, such as building foundations, retaining walls, roadways/driveways, patios, sidewalks and decks, or interfering with the operation, repair, or maintenance of public utilities;
E. The tree has been identified by a Fire Inspector as a fire hazard;
F. The tree was planted for a commercial tree enterprise, such as Christmas tree farms or orchards;
G. Prohibiting the removal of the tree will conflict with CC&R's which existed at the time this Chapter was adopted;
H. The tree is located on land which is zoned for agriculture (A, ARP, APZ, C-ARP or C-APZ) and that is being used for commercial agricultural purposes. (This criterion is provided to recognize the agricultural property owner's need to manage these large properties and continue their efforts to be good stewards of the land.);
I. The tree removal is by a public agency to provide for the routine management and maintenance of public land or to construct a fuel break;

J. The tree removal is on a developed lot and: 1) does not exceed two protected trees within a one-year timeframe; 2) does not entail the removal of any heritage trees; and 3) does not entail the removal of any protected or heritage trees within a Stream Conservation Area or a Wetland Conservation Area.

It is recommended that a property owner obtain a report from a licensed arborist or verify the status of the tree with photographs to document the applicability of the criteria listed above to a tree which is considered for removal in compliance with this section. (Ord. No. 3577, 2012)

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan are relevant to the project. Multiple Implementation Programs support each of these policies; they are described fully in the Countywide Plan (County of Marin, 2007).

Biological Resources

Goal BIO-4: Riparian Conservation.

Policy BIO-4.7: Protect Riparian Vegetation. Retain riparian vegetation for stabilization of streambanks and floodplains, moderating water temperatures, trapping and filtering sediments and other water pollutants, providing wildlife habitat, and aesthetic reasons.

Implementation Policy BIO-4.f, Identify Potential Impacts to Riparian Systems. At the time of a development application, evaluate potential impacts on riparian vegetation and aquatic habitat, and incorporate measures to protect riparian systems into the project design and construction. Retain and minimize disturbance to woody and herbaceous riparian vegetation in Stream Conservation Areas and adjacent areas. (Tree growth may be cleared from the stream channel where removal is essential to protect against property damage or prevent safety hazards.)

Community Design

Goal DES-4: Protection of Scenic Resources. Minimize visual impacts of development and preserve vistas of important natural features.

Policy DES-4.1: Preserve Visual Quality. Protect scenic quality and views of the natural environment — including ridgelines and upland greenbelts, hillsides, water, and trees — from adverse impacts related to development.

Implementing Program DES-4.a, Protect Key Public Views. Work with community groups to identify, map, and protect important view corridors. Establish design standards for development in these areas as part of the design review requirements and individual community plans (see DES-3.b).

Implementing Program DES-4.b, Minimize Visual Impacts of Public Facilities. Amend applicable codes and procedures to require appropriate placement,

design, setbacks, and native landscaping of public facilities (including soundwalls, medians, retaining walls, power lines, and water tanks) to reduce visual impacts, and encourage local agencies to adopt similar standards.

Town of Ross Municipal Code

The following policies and codes of the Town of Ross Municipal Code related to aesthetics are applicable to the project (Town of Ross, 2020).

Chapter 12.24 Planting, Alteration, Removal, or Maintenance of Trees

Purpose (5) To promote and Maintain the aesthetic values of the community in general for the benefit of those who currently reside in Ross and as a legacy to future residents. (Ord. 659 (part), 2015; Ord. 568 (part), 2002).

Section 12.24.080 Tree Alteration or Removal Permits and Appeal. (4) Replacement tree. Unless otherwise specified by the Public Works Director or Town Council, replacement trees shall be required at the following ratios:

(a) A tree in good or excellent condition and structure shall be replaced on a one-to-one trunk diameter basis. (Example: 1 21″ dbh tree in good or excellent condition must be replaced with new trees totaling 21″ trunk diameter);

(b) A tree in fair or marginal condition or structure shall be replaced on a three-to-one trunk diameter basis. (Example: a 21″ dbh tree in fair or marginal condition must be replaced with new trees totaling 7″ trunk diameter);

(c) A tree in poor condition or creating a hazard to a building and/or structure, shall be replaced with 2 inches replacement trunk diameter.

Inches of replacement tree may be translated into standard nursery planting sizes using the following formulas:

24″ box replacement tree = 2 inch replacement trunk diameter

36″ box replacement tree = 3 inch replacement trunk diameter

48″ box replacement tree = 4 inch replacement trunk diameter

If native species are removed, replacement trees shall be of a species native to those lands that now constitute the Town of Ross, or a non-native species approved by town staff based on specific site circumstances. Replacement trees should have the same mature size as the trees that have been removed, unless town staff recommends otherwise based on specific site circumstances. If there is a conflict between arborists regarding the condition or structure of a tree, the town arborist's decision shall control. The Town Council or Public Works Director may reduce the number of replacement trees or the tree replacement ratio, as applicable, if the reduction will not negatively impact the environmental functions and value of the urban forest or the aesthetic values of the community.

The applicant shall complete tree replacement within sixty (60) days of tree removal, unless the Town has approved a longer time. Failure to plant required tree replacement may subject the property owner to Administrative Penalties under Chapter 9.70 until the replacement trees are planted.

Town of Ross General Plan

The following policies of the Ross General Plan related to aesthetics are applicable to the project (Town of Ross, 2007).

Goal 1. An Abundance of Green and Healthy Natural Systems

1.1 Protection of Environmental Resources. Protect environmental resources, such as hillsides, ridgelines, creeks, drainage ways, trees and tree groves, threatened and endangered species habitat, riparian vegetation, cultural places, and other resources. These resources are unique in the planning area because of their scarcity, scientific value, aesthetic quality and cultural significance.

Goal 3. Design with Nature, Neighborhood and Community

3.5 View Protection. Preserve views and access to views of hillsides, ridgelines, Mt. Tamalpais and Bald Hill from the public right-of-way and public property. Ensure that the design look and feel along major thoroughfares maintains the "greenness" of the Town.

Kentfield/Greenbrae Community Plan

The following goals of the Kentfield/Greenbrae Community Plan related to aesthetics are applicable to the project (Kentfield/Greenbrae Community Planning Group and Marin County Planning Department, 1987).

Goal 10: To the greatest extent possible, preserve the natural beauty and view corridors of the planning area. Protect and enhance environmental resources in accord with policies of the Marin Countywide Plan.

3.1.6 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it would:

a. Have a substantial adverse effect on a scenic vista;
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings (public views are those that are experienced from publicly accessible

vantage point). If the project is in an urbanized area, the project would conflict with applicable zoning and other regulations governing scenic quality; or

d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Given the nature of the project setting within a park and along a creek, impacts are analyzed in this section relative to the following additional threshold:

e. Substantially degrade the existing visual character or quality of public views (public views are those that are experienced from publicly accessible vantage point) of the site and its surroundings

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to changes in the visual character or other aesthetic impacts in the project area. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

Impacts to visual quality were assessed based on a combination of the existing visual quality, the visual sensitivity as described in Section 3.1.3 and the degree of degradative visual change that the project would cause as illustrated in Table 3.1-2 below. The degree of visual change was assessed using the baseline photos of the project area from public vantage points and visual simulations of the project from the same vantage point after project implementation. The baseline visual conditions and simulated visual conditions were compared to evaluate the degree of visual change that would result from the project. Visual changes and associated impacts are measured by three factors, described below:

- **Visual contrast** would be significant if it is strong as a result of regraded landforms, alteration or elimination of ridgelines, and changes introduced by a project element that result in landscape colors, textures, and scale of visual elements that are inconsistent with project surroundings.
- **View obstruction** would be considered significant if the project component would obstruct foreground (0 to 0.5 mile) or middle-ground (0.5 to 3 miles) views of the "viewed area" seen from sensitive viewpoints. The viewed area is the area of landscape within the field of vision. The sensitive viewpoint is that from which a view of notable visual quality may be observed.
- **Degraded visual quality** would be considered significant if a project element severely alters or displaces specific scenic resources such as vivid landform features, aesthetic water bodies, mature stands of native/cultural trees (e.g., historic hedgerows), or historic structures.

Visual impacts would be considered to be significant overall based on the level of visual sensitivity and degree of visual change. Construction impacts on visual quality are assessed as those impacts that occur during the construction period. Operation and maintenance impacts

are assessed as those impacts that persist after construction and into the operation and maintenance period for the project.

Table 3.1-2 Approach to Determining Significance of Visual Impacts

Visual Sensitivity	Visual Change: Low	Low to Moderate	Moderate	Moderately High	High
Low	Not Significant	Not Significant	Adverse, Not Significant	Adverse, Not Significant	Adverse, Not Significant
Low to Moderate	Not Significant	Adverse, Not Significant	Adverse, Not Significant	Adverse, Not Significant	Adverse, Not Significant
Moderate	Adverse, Not Significant	Adverse, Not Significant	Adverse, Not Significant	Adverse, Potentially Significant	Adverse, Potentially Significant
Moderate to High	Adverse, Not Significant	Adverse, Not Significant	Adverse, Potentially Significant	Adverse, Potentially Significant	Significant
High	Adverse, Not Significant	Adverse, Potentially Significant	Adverse, Potentially Significant	Significant	Significant

Not Significant. Impacts may or may not be perceptible but are considered minor in the context of existing landscape characteristics and view opportunity.

Adverse, Not Significant. Impacts are perceived as negative but do not exceed environmental thresholds.

Adverse, Potentially Significant. Impacts are perceived as negative and may exceed environmental thresholds depending on project and site-specific circumstances. Mitigation may be required to reduce impacts to less than significant.

Significant. Impacts with feasible mitigation may be reduced to less than significant levels or avoided all together. Without mitigation or avoidance measures, significant impacts would exceed environmental thresholds. If feasible mitigation does not avoid or reduce the degree of visual change to a level that would be less than significant, the impacts is significant and unavoidable.

3.1.7 Impact Discussion

Impacts Avoided

Due to the nature of the project, there would be no impacts related to the following criteria; therefore, no impact discussion is provided for the reasons described below:

1. **Criterion (b):** Implementation of the project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway because there are no designated

or eligible state scenic highways within the project viewshed. No impacts would occur.

2. **Criterion (d):** Implementation of the project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area because no temporary or permanent lighting is proposed. No impacts would occur.

Impacts Analyzed

	Significance Determination
	Construction: Less than Significant
Impact 3.1-1: The project would not have a substantial adverse effect on a scenic vista.	**Operation and Maintenance: Less than Significant**

Construction

There are no designated scenic vistas within the Town of Ross or Kentfield. The Town of Ross and Kentfield are located on the valley floor, and scenic vistas on the valley floor are limited, given the intervening development, street trees, and vegetation. Because of the low profile of Corte Madera Creek, as well as the dense vegetation within the project area, construction of the project would not be visible from publicly accessible areas outside of Bike Route 20, informal unnamed paths, A.E. Kent Middle School, College of Marin campus, pedestrian and vehicle bridges, and public roads abutting or crossing the creek. While motorists could view project construction from bridges and public roads abutting or crossing the creek, views would be short-lived (a few seconds) given the speed of travel. Cyclists and pedestrians would be the primary viewers of project construction from the public areas listed above.

Scenic vistas are available from publicly accessible viewpoints along the ridgelines surrounding the valley floor. Corte Madera Creek is generally screened from view by trees from these viewpoints. Due to the distance from the ridgelines and the even cover of street trees and open space, specific details within the project area do not stand out. Project construction would include soil disturbing activities, including removal of the concrete channel within Frederick Allen Park and lower Unit 2, grading in Unit 4, tree removal, and excavation of larger fish pools. Construction of the project would involve removal of up to approximately 369 trees from along the creek, including up to 144 trees within Frederick Allen Park. The loss of these trees would have local visual effects in the short term as discussed in Impact 3.1-3; however, the tree removal would not substantially impact views from scenic vistas because the project area would not be discernible from the surrounding valley floor due to the distance of the project area from scenic viewpoints. The tree removal would occur along the creek but would not be a significant change in the tree cover in the context of the entire valley floor. The project would also not block views of any scenic vista because the project features are located below grade or are low lying. Because the project construction would not be visually discernible from any scenic vista and would not block views of any scenic vista, the impact would be less than significant.

Operation and Maintenance

Once constructed, the project area would include an earthen widened channel and realigned pathway through Frederick Allen Park, new floodwalls, new fish pools, new stormwater pump station, and concrete removal and creek habitat enhancement. As described above, the changes to the area resulting from the project components would not be discernible from scenic vistas due to the distance of the project from the ridgelines and the limited extent of the new project components in the context of the larger valley floor. The project would not have a substantial adverse effect on views from any scenic vista because the project features would be indistinguishable from the background visual conditions at the distance of the project from potential scenic vistas. The project features are also low profile or below grade and would not block views of any scenic vista from the valley floor. Because the project would not be visually discernible from any scenic vista and would not block views of any scenic vista, the impact on scenic vistas during project operation would be less than significant.

Mitigation: None required.

	Significance Determination
	Construction: Less than Significant
Impact 3.1-2: The project would not conflict with applicable zoning and other regulations governing scenic quality	**Operation and Maintenance: Less than Significant**

A discussion of the project's potential conflicts with adopted aesthetics or visual policies or standards is provided below. Because the project is located within an urban area designated in the Marin Countywide Plan, this analysis therefore focuses only on conflicts with applicable zoning and does not address visual quality consistent with CEQA Guidelines Appendix G. Visual quality is addressed separately in Impact 3.1-3, below.

Federal and State Regulations

There are no federal visual policies or standards related to aesthetics or visual resources applicable to the project. The project would not involve temporary or permanent nighttime lighting that would conflict with the Title 24 standards for outdoor lighting. The project would not conflict with federal or state visual policies or standards because none are applicable to the project.

Marin Municipal Code

Chapter 22.27, Native Tree Protection and Preservation, of the Marin Municipal Code prohibits tree removal except in compliance with Section 22.62.040 which requires tree removal permits prior to tree removal. Tree removal associated with the project would be exempt from the requirements Chapter 22.62, Tree Removal, because tree removal would be by a public agency to provide for routine management and maintenance of public land. Therefore, the project would not conflict with the Marin Municipal Code and there would be no impact.

Marin Countywide Plan

Marin Countywide Plan Policy BIO-4.7 calls for the protection of riparian vegetation, in part for aesthetics reasons. One of the objectives of the project is to improve fish passage, natural creek processes, and fish and riparian habitat adjacent to the creek. While construction of the project would involve the removal of trees and vegetation within Frederick Allen Park, the existing vegetation is separated from the creek by a 10-foot-tall concrete floodwall. The project would connect vegetation to the natural creek hydrology and increase riparian vegetation within Unit 4 and Frederick Allen Park (upper Unit 3). The project would increase vegetation interaction with the creek, resulting in long-term benefits to water quality in the creek and habitat. The project would have a beneficial impact on riparian habitat and would not conflict with Policy BIO-4.7.

The project would not conflict with Marin Countywide Plan Policy DES-4.1: Preserve Visual Quality. As described in Impact 3.1-1, the project would not impact scenic vistas or views of the natural environment. The project includes landscaping and tree planting that is compatible with the natural environment and would create a natural riparian corridor and saltwater marsh areas along portions of Corte Madera Creek. The tree planting would help screen the new concrete retaining walls over time and would be consistent with the policy. The proposed floodwall elements in Units 3 and 2 would result in low degree of visual contrast with the existing floodwall and would not obstruct the view of substantially degrade the visual quality of the area. The degree of visual change from the new floodwall would be low. Because the project would implement landscaping consistent with County design standards and would employ design features that are compatible with the existing visual context, the impact would be less than significant.

Town of Ross General Plan

The intent of Goal 1 of the Town of Ross General Plan is to protect environmental resources, including creeks trees and riparian vegetation, in part for their visual quality. As discussed above, the project would involve riparian vegetation planting to achieve the project objective of improvement to natural creek processes and fish and riparian habitat adjacent to the creek. Any trees removed within the Town of Ross would be replaced in compliance with Town of Ross requirements for tree replacement and the portion of the project in Unit 4 would have increased trees due planting of willows along the stream. The project would not conflict with Goal 1 of the Town of Ross General Plan because the project would benefit environmental resources and involve planting with trees that are native to the riparian environment; therefore, there would be no impact.

As discussed above and in Impact 3.1-1, the project would not impact scenic vistas or views, including views of hillsides, ridgelines, Mt. Tamalpais, and Bald Hill. No project components are proposed along major throughfares. The project would not conflict with Goal 3 of the Town of Ross General Plan; therefore, there would be no impact.

Town of Ross Municipal Code
Chapter 12.24 of the Municipal Code provides ratios for replacing trees that have been removed. The project would adhere to the mitigation ratios and tree replacement standards in the Town of Ross Municipal Code, and the District would obtain a tree removal permit from the Town of Ross to ensure there would be no conflict. Because the District would provide tree planting and replacement at the ratio required by the Town of Ross and obtain a tree removal permit from the Town of Ross, the impact from conflict with Town of Ross Municipal Code would be less than significant.

Kentfield/Greenbrae Community Plan
The intent of Goal 10 of the Kentfield/Greenbrae Community Plan is to preserve the natural beauty and view corridors of the planning area. As discussed previously, the project would not affect scenic views or vistas. The Kentfield/Greenbrae Community Plan would apply to portions of the project in lower Unit 3 and Unit 2. The project would not degrade the natural beauty or view corridors in the Kentfield community because the project is not located within the viewshed of any view corridors. The project would therefore not conflict with the Kentfield/Greenbrae Community Plan and there would be no impact.

Mitigation: None required.

	Significance Determination
Impact 3.1-3: The project would substantially degrade the existing visual character or quality of public views of the site and its surroundings	**Construction: Less than Significant**
	Operation and Maintenance: Significant and Unavoidable

Overview
Visibility
Public views of the project area are available from Frederick Allen Park, Bike Route 20, the informal unnamed paths adjacent to the creek opposite Bike Route 20, College of Marin Campus, and public roads abutting or crossing the creek. The analysis of project impacts on visual quality from public vantage points in Frederick Allen Park and along Bike Route 20 approximates the impacts on visual quality at adjacent private properties; however, impacts on private views are not required to be considered under CEQA.

Because of the low profile of the project, intervening buildings, and dense vegetation within the project area (adjacent to the creek and between residences and buildings that parallel the creek as well as along Sir Francis Drake Boulevard and Poplar/Kent Avenue), it was determined that the project would generally not be visible from public areas outside of Bike Route 20, informal unnamed paths, A.E. Kent Middle School, College of Marin campus, pedestrian and private vehicle bridges, and public roads abutting or crossing the creek.

Visual Quality
Key observation points (KOPs) were selected from areas where the project components would be visible in order to evaluate project changes on visual quality. Visual simulations were

prepared for each of three selected KOPs in order to document the existing conditions and changes in visual character and quality that would occur as a result of the project. The selected KOP locations are shown on Figure 3.1-1. The visual-simulation locations were selected to provide a comprehensive view of the project elements and visual change. The visual simulation location within Frederick Allen Park was specifically selected because it is a location where the Bike Route 20 location would not be modified by the project, which provides for easy comparison between existing and post-project conditions. The visual simulation location at the southern limits of the proposed Frederick Allen Park grading also provides a comprehensive view of the changes within the park, end to end. The location of the visual simulation for the stormwater pump station provides an open, unimpeded view of the stormwater pump station infrastructure. The visual simulation of the taller floodwall is provided from an area where there is less vegetation screening on the Bike Route 20 pathway to allow for a more open view of the taller floodwall. The simulations provide a worst-case visual impact by showing the maximum amount of tree removal, and in the case of the new floodwall, we have also included a simulation showing the condition if a 15-foot vegetation setback from the existing floodwall is not required by the USACE in the Section 408 process.

As discussed under Section 3.1.4 Environmental Setting, Unit 4 is regarded as having moderate visual quality due to the natural channel characteristics of the creek and the vegetated banks; however, many human-made features and disturbances are present. The visual quality of Unit 3 within the Town of Ross is considered lower than the more natural condition of Unit 4 upstream. The overall appearance of the creek in Units 3 and 2 is characterized as highly modified, with low visual quality and scenic integrity. Frederick Allen Park within Unit 3 maintains a moderate visual quality due to the dense vegetation that blocks views of surrounding development and reduces and screens views of the concrete channel.

Viewer Sensitivity

Bike Route 20 is used by bicyclists and pedestrians as a recreational path and used by commuters traveling through the Town of Ross and Marin County. Viewer sensitivity of bicyclists and pedestrians varies along the length of Bike Route 20 within the project area.

Viewer sensitivity along Bike Route 20 within Unit 3 Frederick Allen Park is considered high, due the high number of viewers and the resting areas (e.g. benches) which allow for longer duration of views and more viewer exposure. Comments received during EIR scoping discuss the visual sensitivity of Frederick Allen Park and the importance of the tree canopy to the visual quality of the park. Additionally, bicyclists and pedestrians would be in close proximity to the changes proposed in Frederick Allen Park.

Viewer sensitivity along Bike Route 20 within Unit 3 Granton Park floodwall and Unit 2 floodwall areas is considered moderate. The existing floodwalls would minimize the degree to which modifications would be apparent in the visual setting and viewer attention would vacillate between the left bank, the creek, and the right bank. Viewer duration would be approximately six to eight minutes as viewers move along the pathway opposite the floodwall. Views of the floodwall would be interrupted by vegetation along the pathway that

intermittently screens views of the concrete channel and floodwall. Similar to Unit 3 and Unit 2, viewer sensitivity along Bike Route 20 within the Unit 2 concrete channel removal area is considered moderate.

Laurel Avenue is within the project area adjacent to the proposed stormwater pump station and is used by motorist, bicyclists, and pedestrians. Viewer sensitivity within the Unit 3 stormwater pump station area is considered low to moderate due to the lower number of viewers and short duration of views from individuals driving on Laurel Avenue.

Lagunitas Road is within the project area and is used by motorists, bicyclists, and pedestrians. Viewer sensitivity along Lagunitas Road in the vicinity of Unit 4 is low because motorists, bicyclists, and pedestrian would be focused on the road, and not toward Unit 4 and the viewer exposure from Lagunitas Road toward Unit 4 is less than 100 feet and the view duration of the project area would last a few seconds as motorists, bicyclists and pedestrians cross Laguntias Road bridge.

Construction

Construction-related activities would temporarily influence the character of the project area as viewed from the Bike Route 20, informal unnamed paths, A. E. Kent Middle School, College of Marin campus, pedestrian and private vehicle bridges, and adjacent public roads. Graded surfaces, excavations, stockpiled soils, construction equipment and materials, and construction trucks and vehicles accessing the project area would be visible within portions of the project area during the seven-month construction period. The project would require the removal of a minimum of 167 trees and a maximum of approximately 369 trees from along the creek. While construction activities would result in a moderately high degree of visual change due to the removal of trees, alteration and grading in Frederick Allen Park, and presence of construction equipment materials. The public would be kept out of the construction area and a large segment of Bike Route 20 along the majority of Unit 3 and through Frederick Allen Park would be closed during the construction period for safety as discussed in Section 3.14 Transportation. Views of construction would be limited to views of floodwall installation in Unit 2 and a portion of lower Unit 3 where visual quality is low under existing circumstances. Viewer sensitivity during construction would be low to moderate because viewers would be less sensitive to the visual change from the presence of construction equipment and vehicles due to the limited views of construction work and temporary nature of project construction in lower Unit 3 and Unit 2. Construction of the floodwall in lower Unit 3 and Unit 2 would move along the floodwall installation area and construction would only occur in each area for a couple of weeks. The lower Unit 2 construction would last up to six weeks Because the majority of the construction area would be off limits to the public and out of view and the visible construction activities in lower Unit 3 and Unit 2 would be very short in duration, the impact on visual character and quality during the construction period is less than significant.

Operation and Maintenance

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

The proposed work within Unit 4 would consist of removal of the existing fish ladder, removal of 21 trees, grading within channel and banks, and channel stabilization measures including planted rock, vegetation, erosion-control fabric, and engineered streambed material.

The visual character of Unit 4 would not substantially change. Viewers would view a slightly lower and wider channel, particularly at the connection to Unit 3. The lowering of the channel would be very gradual and likely indiscernible as the channel approaches Lagunitas Road Bridge resulting in weak visual contrast. The channel bed would remain earthen, as it currently is. The removal of 21 trees from Unit 4 would not be obvious to viewers given the highly vegetated setting of Unit 4, and the larger trees along the streambanks and adjacent to Lagunitas Road that generally screen the channel would remain and the degree of visual change would be low. Publicly accessible views of Unit 4 are from the Lagunitas Road Bridge, and from the parking lot just south of the United States Postal Service building, west of the creek. Views from Lagunitas Road toward Unit 4 would last for seconds for motorists and bicyclists and less than a minute for pedestrians where the road crosses the creek. Motorists, bicyclists, and pedestrians would be traveling perpendicular to the creek and would have to adjust their views to the north or south to view the creek corridor where the roadway crosses the creek. The project modifications in Unit 4 would not substantially degrade the existing visual character or quality of public views of the site or surroundings. Potential views into Unit 4 from adjacent public spaces would be short in duration; therefore, the viewer sensitivity would be low to moderate and the visual change would be low because all of the proposed project elements, including streambank stabilization measures and natural channel conditions, are currently visible within the Unit 4 viewshed. Once construction is complete, the publicly accessible views of Unit 4 would be similar to the existing visual setting. Because the viewer sensitivity is low to moderate and degree of visual change would be low, the resulting impact on visual character and quality would be less than significant.

Unit 3 Frederick Allen Park

An existing view of Frederick Allen Park from the tennis courts looking north is provided in Figure 3.1-11. The project elements within Frederick Allen Park include removal of the concrete channel, construction of concrete floodwalls, and excavation and grading within the channel and park to provide creek corridor widening and natural floodplain benches and banks connecting to Frederick Allen Park. The improvements also include a pedestrian path within the park. 10-foot-tall retaining walls would be installed on the left and right bank at the connection to Unit 4. An 80-foot-long floodwall, approximately 2 feet above ground, would be constructed along the western edge of Frederick Allen Park, and an approximately 240-foot-long 2-foot-tall floodwall would be constructed on the left bank of the creek. Existing shrubs

and vegetation, including a minimum of 113 trees and a maximum of approximately 144 trees[1] would be removed from within the park to accommodate the new park design. A minimum of 89 trees and up to 125 trees would be planted within Frederick Allen Park depending on the final project design and USACE authorization[1]. The project also includes planting of other shrubs and vegetation as indicated on the planting plan in Appendix B. The District would also install temporary shade structures as required by Mitigation Measure 3.12-3: Temporary Shade Structures (see Section 3.12 Recreation) to provide temporary shade along Bike Route 20 after tree planting and until a tree canopy has re-established. A visual simulation of the park one year after construction (Figure 3.1-12) illustrates the proposed modifications to the park, following new landscape planting and prior to the new vegetation maturing, when the park grading and new retaining walls and structures would be most visible. Visual simulations of the vegetation approximately 10 and 20 years after landscaping (Figure 3.1-13 and Figure 3.1-14) show the expected visual conditions after vegetation establishment. The visual simulations on Figure 3.1-12 through Figure 3.1-14 reflect the minimum number of trees that would be planted within the park with a 15-foot setback from the new floodwalls.

A key visual element in the existing Frederick Allen Park viewshed is the dense vegetation and large trees that form a canopy within the park and screen views of surrounding commercial and residential structures and the concrete channel. The tree canopy is a defining feature of the park and the vegetation and tree canopy contribute to the harmony, order, and coherence of the park.

The visual character of the park, as viewed from Bike Route 20, would change in the years immediately following construction from a pathway, highly vegetated on both sides with dense tree canopy cover, to a pathway with adjacent exposed areas of dirt in between the newly planted landscaping, the new exposed earthen channel, exposed retaining walls, and minimal tree cover and shade as shown in Figure 3.1-12. The area of tree removal would be replaced with native vegetation including shrubs, grasses, and riparian trees as shown in Appendix B; however, it would take approximately 10 to 20 years for the trees to mature and provide coverage comparable to existing conditions, as shown on Figure 3.1-13 and Figure 3.1-14. The surrounding structures would become more visible while the trees are establishing due to the reduction in tree canopy cover. Views of architectural elements, including homes and commercial buildings and new retaining walls, would be a deviation from the dense vegetation in the existing park setting and would result in a moderate to high degree of visual change. The moderate to high degree of visual change coupled with the high visual sensitivity would result

[1] As discussed in Chapter 2, Project Description, the higher estimate of tree removal reflects a 15-foot separation between the proposed short floodwall and trees. The exact number of trees required for removal cannot be determined until the District has obtained USACE Section 408 authorization. The USACE guidelines for landscape plantings and vegetation management at levees and floodwalls requires a 15-foot separation between floodwalls and trees. It is uncertain whether USACE will consider the 2-foot-tall floodwall a structure that requires a 15-foot separation from trees.

in a significant impact on visual quality immediately following vegetation establishment and until the tree canopy and vegetation have re-established in the park. The proposed shade structures are not expected to be a substantial contributing element to the significant visual impact because the shade structure design would be selected in coordination with the Town of Ross to blend in harmoniously with the park environment. The District would implement **Mitigation Measure 3.1-3: Large Tree Planting**, which requires the District to integrate large box trees into the planting plan and design for Frederick Allen Park to the extent feasible. While planting larger trees in the park would minimize impacts to visual quality immediately following construction, the large box trees would not provide the same canopy cover and visual screening as the existing fully grown trees that would be removed. The impact to visual quality would remain significant and unavoidable in the years immediately following project implementation because the available mitigation (larger tree planting) would provide less dense canopy cover and associated screening of concrete walls and surrounding buildings than the existing tree canopy and vegetation.

After a period of approximately 10 years, a new tree canopy would become established, and the visual character of the park would be similar to the existing conditions where trees shade the pathway and screen views of the surrounding buildings and structures as shown in Figure 3.1-13. After 20 years, the trees would mature and an extensive tree canopy would cover the park, as shown in Figure 3.1-14. The improvements to the park, including tree planting, additional seating, educational signage, and access to the creek would provide views of a natural creek corridor and would provide greater wildlife viewing opportunities due to the wildlife that would be attracted to the area. After a tree canopy has re-established in the park, the project would result in a more harmonious and coherent scene due to the integration of natural vegetation and consistency with the upstream Unit 4 natural channel. The resulting visual impact after tree canopy establishment would be beneficial. The visual contrast of the project retaining and floodwalls with the surrounding area would be lessened by the project landscaping and vegetation. While the impacts of the project on the existing visual character and quality at Frederick Allen Park would be significant and unavoidable immediately following construction and for a period of approximately 10 years, impacts would become less than significant and beneficial after the landscaping matures and provides cover and visual screening from the surrounding residential and commercial areas.

Unit 3 Granton Park Floodwall and Stormwater Pump Station

The project elements within the lower reach of Unit 3 include construction of floodwalls, a pump station at Laurel Avenue, removal of up to 94 trees (86 for floodwall segments #2 and #3 and eight for the pump station) and up to 16 fish pools within the channel.

The visual character of the stormwater pump station location is most apparent from the end of Laurel Avenue and slightly visible from Bike Route 20. Views of the stormwater pump station location from Bike Route 20 are obscured by existing vegetation growing along the fence at the top of the right bank floodwall. The existing visual setting at the stormwater pump station includes slightly disturbed vegetation adjacent to a paved roadway and residential development and college buildings and infrastructure (Figure 3.1-15). The pump station would

generally be visible from Laurel Avenue and the surrounding area and would generally not be visible from Bike Route 20 because it would be located behind the newly constructed floodwall and the infrastructure would be low profile and mostly below grade. Figure 3.1-16 provides a visual simulation of the proposed pump station. The majority of the pump station would be underground, and the height of the above-ground components would be approximately 7 feet, with the dimensions of the concrete pad being 6 feet wide and 13 feet long. The pump station would have a weak visual contrast because the location is in a disturbed area surrounded by a paved roadway and existing development, resulting in low degree of visual change. The project would not substantially degrade the existing visual character or quality of public views of Unit 3 because of the low visual quality of the area and the weak visual contrast of the pump station. The low degree of visual change coupled with low to moderate visual sensitivity would result in a less than significant impact on visual quality.

The visual character of Unit 3, as viewed from Bike Route 20, would not substantially change. Approximately 1,075 feet of the left bank of the creek would change from an existing floodwall to a taller floodwall extending approximately 2 to 4 feet above the existing concrete wall. The floodwall could also be set back from the existing channel wall by approximately 10 feet at the edge of the District property. If the floodwall is constructed as an extension of the existing channel wall, no trees would need to be removed as a part of the project. However, it is within the jurisdiction of USACE to require tree removal within 15 feet of the existing floodwall based on their guidance for landscape management along floodwalls. USACE could require tree removal within 15 feet of the existing floodwall at any time even if the project were not implemented, and tree removal could be required by USACE during project construction. Figure 3.1-17 shows an existing view of Unit 2, which is similar in visual quality to the lower reach of Unit 3. Figure 3.1-18 provides a visual simulation of the floodwall proposed in Unit 2, above the existing floodwall with vegetation removed from within 15 feet of the floodwall, and Figure 3.1-19 provides a visual simulation of the floodwall with the existing vegetation retained. With construction of the floodwall, the open area and disturbed vegetation on the left bank would no longer be visible. Views of the creek and the right bank of the creek would be maintained. Tree removal would not be obvious to viewers given the height of the new floodwall, which would block trees if they were retained behind the floodwall. While some trees would be visible behind the floodwall in the tree-retention option, the visual character and quality would not be substantially different from the view without trees. Because the existing setting of Unit 3 is of low visual quality, the slightly taller floodwall would have a weak visual contrast and the new floodwall in Unit 3 would not substantially degrade the existing visual character of Unit 3. The low degree of visual change coupled with the low to moderate visual sensitivity would result in a be less than significant.

Unit 2 Floodwall

The Unit 2 floodwall includes installation of a new floodwall approximately 2 to 4 feet tall and potential removal of up to 71 trees. As noted above, the floodwall may be attached to the existing floodwall or set back from the floodwall by approximately 10 feet. If the floodwall is attached to the existing floodwall, trees may not need to be removed; however, the USACE could enforce a 15-foot setback from the existing floodwall in accordance with their guidance.

The visual character of Unit 2, as viewed from Bike Route 20, would not substantially change. A 2- to 4-foot-tall floodwall would be visible at the top of the existing floodwall for a length of approximately 945 feet of the left bank of the creek. Figure 3.1-17 shows an existing view of Unit 2, and Figure 3.1-18 provides a visual simulation of the floodwall proposed in Unit 2, above the existing floodwall with removal of trees within 15 feet of the floodwall. Figure 3.1-19 provides a visual simulation of the floodwall with trees retained to illustrate the range of potential project conditions. With construction of the floodwall, the open area and disturbed vegetation on the left bank would no longer be visible. Views of the creek and the right bank of the creek would be maintained. As described under Unit 3, tree removal may be required by USACE along the floodwall. Tree removal would not be obvious to viewers given the height of the new floodwall, which would block trees if they were retained behind the floodwall. The visual quality of Unit 2 with trees removed would not be substantially different from the view with trees retained. Because the existing setting of Unit 2 is of low visual quality, the taller floodwall with or without tree removal would result in a weak visual contrast and would not substantially degrade the existing visual character of Unit 2. The low degree of visual change coupled with the low to moderate visual sensitivity would result in a less than significant impact.

Unit 2 Lower College of Marin Concrete Channel Removal

The visual character of the lower reach of Unit 2, as viewed from Bike Route 20 and the informal/unnamed path on the right bank below Stadium Way, would change from a concrete channel to a natural creek with tidal and wetland habitat and would include potential removal of up to 39 trees (see Figure 3.1-20 and Figure 3.1-21). The existing visual quality in the lower College of Marin concrete channel removal area is low. Removal of the concrete and creation of natural habitat with native vegetation would result in a beneficial impact and would reduce visual contrast with the lower reaches of Corte Madera Creek, where it widens and eventually flows into the San Francisco Bay. The transition of the concrete channel to natural creek would be an apparent beneficial visual change, reducing visual contrast with the surrounding natural creek channel. The visual impact from removing the concrete and creating salt marsh habitat would be beneficial and the low degree of visual change coupled with the low to moderate visual sensitivity would result in a less than significant impact.

> **Mitigation:** Implement Mitigation Measure 3.1-3.
>
> **Mitigation Measure 3.1-3: Large Tree Planting.** The District will integrate large box trees into the final planting plan and design for Frederick Allen Park to the extent ecologically appropriate for the proposed species. The final planting plan will be provided to the Town of Ross for review and comment no less than 90 days prior to landscaping.
>
> **Significance after Mitigation:** The mitigation would reduce the visual impact immediately following landscaping by providing increased screening of concrete structures and surrounding buildings; however, the impact would remain significant and unavoidable until the tree canopy is re-established and the trees and vegetation screen the retaining walls and adjacent structures.

Figure 3.1-11 KOP 1: Existing View of Frederick Allen Park, Unit 3



Figure 3.1-12 KOP 1: Visual Simulation of Frederick Allen Park, One Year After Construction



Figure 3.1-13 KOP 1: Simulation of Frederick Allen Park, 10 Years After Construction



Figure 3.1-14 KOP 1: Simulation of Frederick Allen Park, 20 Years After Construction



Figure 3.1-15 KOP 2: Existing View of Pump Station Location, Unit 3



Figure 3.1-16 KOP 2: Visual Simulation of Pump Station, Unit 3



Figure 3.1-17 KOP 3: Existing View of Floodwall Location, Unit 2



Figure 3.1-18 KOP 3: Visual Simulation of Floodwall with Trees Removed, Unit 2



Figure 3.1-19 KOP 3: Visual Simulation of Floodwall with Trees Retained, Unit 2



Figure 3.1-20 Existing View of Lower College of Marin Concrete Channel Removal, Unit 2



Figure 3.1-21 Visual Simulation of Lower College of Marin Concrete Channel Removal, Unit 2



3.1.8 References

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3.2 Air Quality

3.2.1 Introduction

This section addresses the existing air quality conditions within the region and presents an evaluation of the potential effects to air quality from implementation of the project. The air quality analysis is based on air quality modeling and project features. Modeling assumptions and calculations are provided in Appendix C.

3.2.2 Scoping Comments

Comments related to air quality impacts were received during the public scoping process. These comments and the location where they are addressed in the air quality analysis are provided in Table 3.2-1.

Table 3.2-1 Air Quality Scoping Comments

Agency/Entity	Comment	Location in Air Quality Section that Comment is Addressed
Garril Page	No one in Ross welcomes the toxic traffic fumes of Sir Francis Drake Blvd. The FAP Riparian Corridor results in increased air pollution from SFD and diminished air quality for at least 10 years, probably longer, until proposed trees mature. Deciduous trees will be less effective in removing toxic fumes. and improving air quality. The longer construction period of FAP Riparian Corridor means extended, expanded exposure to all aspects of construction-caused air pollution.	Section 3.2.6, Impact 3.2-3

3.2.3 Environmental Setting

Air Pollutant Standards and Definitions

Overview

The U.S. Environmental Protection Agency (USEPA) has set air-pollutant emission standards to protect public health. USEPA has set National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and particulate matter. Particulate-matter criteria pollutants are classified as either respirable particulate matter less than 10 micrometers in diameter (PM_{10}) or fine particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$). The California Air Resources Board (CARB) has set California Ambient Air Quality Standards (CAAQS) for four pollutants in addition to the six NAAQS criteria pollutants: sulfates, hydrogen sulfide (H_2S), vinyl chloride (C_2H_3Cl), and visibility reducing particles. Table 3.2-2 presents the NAAQS and CAAQS for the criteria air pollutants at different averaging periods as well as the primary and

secondary standards for each. Primary standards are the levels of air quality necessary to protect public health with an adequate margin of safety. Secondary standards are the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

USEPA and CARB designate air basins or portions thereof as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the NAAQS or CAAQS have been achieved. Thus, areas in California have two sets of attainment/nonattainment designations: one set with respect to the national standards and one set with respect to the state standards. Table 3.2-2 shows the attainment status of the San Francisco Bay Area Air Basin (SFBAAB) with respect to the national and state ambient air quality standards for different criteria pollutants.

Ozone

Ozone is found in the upper atmosphere (as the ozone layer) as well as at ground level. At ground level, ozone is considered a pollutant. Ozone forms when ozone precursors (e.g., reactive organic gases [ROGs], CO, or nitrogen oxides [NO_X]) react with sunlight in the atmosphere. Sources of these precursors include fuel combustion in vehicles and industrial processes, gasoline vapors, and chemical solvents. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone can cause respiratory problems (e.g., chest pain, coughing, or throat irritation) and exacerbate existing respiratory problems such as asthma and bronchitis (USEPA, 2018a). Ozone is at the highest concentrations in summer. Ozone concentrations have steadily decreased in the Bay Area over the last three decades. Ozone one-hour NAAQS exceedances in the SFBAAB occurred on two days in 2017 compared to 36 days in 1980 (CARB, 2018a). Ozone is the main pollutant of concern for the NCCAB; however, ozone concentrations have also been steadily decreasing over the last three decades. Ozone eight-hour CAAQS exceedances in the NCCAB occurred on one day in 2018 compared to 32 days in 1980 (CARB, 2018b).

Nitrogen Dioxide

NO_2 is formed during combustion of fossil fuels from vehicles and industrial processes. NO_2 is an air quality pollutant of concern because it acts as a respiratory irritant. NO_2 is an ozone precursor and can also cause acid rain and acid snow. Health effects of NO_2 include airway inflammation in healthy people and exacerbation of preexisting asthma (USEPA, 2018a). NO_2 is a major component of the group of gaseous nitrogen compounds commonly referred to as NO_x. Typically, NO_x emitted from fuel combustion is in the form of nitric oxide (NO) and NO_x, with the vast majority (95 percent) of the NO_x emissions being comprised of NO. NO is converted to NO_2 in the atmosphere when it reacts with ozone or undergoes photochemical reactions.

Table 3.2-2 NAAQS and CAAQS for Criteria Air Pollutants and SFBAAB Attainment Status

Pollutant	Averaging Time	CAAQS [a]	Attainment Status for CAAQS	NAAQS [b]	Attainment Status for NAAQS
O_3	1 hour	0.09 ppm (180 µg/m^3)	Nonattainment	–	–
	8 hours	0.070 ppm (137 µg/m^3)	Nonattainment	0.070 ppm (137 µg/m^3) [c]	Nonattainment
CO	1 hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3) [d]	Attainment
	8 hours	9.0 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3) [d]	Attainment
NO_2	1 hour	0.18 ppm (339 µg/m^3)	Attainment	0.10 ppm (188 µg/m^3) [e]	–
	Annual arithmetic mean	0.030 ppm (57 µg/m^3)	–	0.053 ppm (100 µg/m^3) [e]	Attainment
SO_2	1 hour	0.25 ppm (655 µg/m^3)	Attainment	0.075 ppm (196 µg/m^3)	–
	24 hours	0.04 ppm (105 µg/m^3)	Attainment	0.14 ppm (365 µg/m^3) [f]	–
	Annual arithmetic mean	None	–	0.030 ppm (81 µg/m^3) [f]	–
Pb	30-day average	1.5 µg/m^3	–	None	–
	Calendar quarter	–	–	1.5 µg/m^3 [g]	Attainment
	Rolling 3-month average	None	–	0.15 µg/m^3	Attainment
PM_{10}	24 hours	50 µg/m^3	Nonattainment	150 µg/m^3 [h]	Unclassified
	Annual arithmetic mean	20 µg/m^3	Nonattainment	None	–
$PM_{2.5}$	24 hours	None	–	35 µg/m^3 [i]	Nonattainment
	Annual arithmetic mean	12 µg/m^3	Nonattainment	12.0 µg/m^3 [j]	Unclassified/Attainment
Sulfates	24 hours	25 µg/m^3	Attainment	None	–
H_2S	1 hour	0.03 ppm (42 µg/m^3)	Unclassified	None	–
C_2H_3Cl	24 hours	0.01 ppm (26 µg/m^3)	No information available	None	–

Pollutant	Averaging Time	CAAQS [a]	Attainment Status for CAAQS	NAAQS [b]	Attainment Status for NAAQS
Visibility reducing particles	8 Hours	Extinction coefficient of 0.23 per kilometer	Unclassified	–	–

Notes:

[a] Pollutant concentrations should not exceed California standards for O_3, CO, SO_2 (1- and 24-hour), NO_2, PM_{10}, $PM_{2.5}$, and visibility reducing particles. Pollutant concentrations shall not equal or exceed any other concentrations.

[b] Pollutant concentrations should not exceed national standards (other than O_3, particulate matter, and those based on annual arithmetic mean) more than once per year. Annual standards should never be exceeded.

[c] An area achieves the O_3 standard when the fourth-highest eight-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard.

[d] An area achieves the CO standard when fewer than two days are equal to or less than the standard.

[e] An area achieves the NO_2 standard when 98 percent of the one-hour maximum concentrations, averaged over three years, are equal to or less than the standard.

[f] No areas of SO_2 nonattainment are located in California.

[g] Los Angeles County is the only area of Pb nonattainment in California.

[h] An area achieves the PM_{10} 24-hour standard when the expected number of days with a 24-hour average concentration greater than 150 µg/m^3 is equal to or less than one in any one calendar year.

[i] An area achieves the $PM_{2.5}$ 24-hour standard when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

[j] An area achieves the $PM_{2.5}$ annual standard when the annual average concentrations, averaged over three years, are equal to or less than the standard.

mg/m^3 = milligrams per cubic meter

µg/m^3 = micrograms per cubic meter

ppm = parts per million

Sources: (CARB, 2016; BAAQMD, 2017b)

Carbon Monoxide

CO is a non-reactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. The primary source of CO in urban areas is from motor vehicles. This being the case, higher concentrations of CO are found along transportation corridors. Exposure to CO results in reduced oxygen-carrying capacity of the blood. High CO concentrations can result in health risks, particularly for individuals with compromised cardiovascular systems (USEPA, 2018b). When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

Particulate Matter

Particulate matter is a combination of liquid or solid particles suspended in the air. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into air passages and the lungs and can cause adverse health effects. PM_{10} particles are a threat to health because they can enter the lungs and are small enough that the respiratory system cannot naturally filter them out. PM_{10} can exacerbate asthma and bronchitis and potentially contribute to premature death (USEPA, 2018a). $PM_{2.5}$ is considered more hazardous to human health than PM_{10} because it can contain a larger variety of dangerous components than PM_{10} and can travel farther into the lungs, potentially causing scarring of lung tissue and reduced lung capacity (USEPA, 2018a). Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. According to a study prepared by CARB, exposure to ambient $PM_{2.5}$, particularly diesel particulate matter (DPM), can be associated with approximately 14,000 to 24,000 premature annual deaths statewide (CARB, 2009). Particulate matter also can damage materials and reduce visibility.

Sulfur Dioxide

SO_2 is a colorless, acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO_2 has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease (BAAQMD, 2017a). Pollutant trends suggest that the SFBAAB currently meets and will continue to meet the federal and state standards for SO_2 for the foreseeable future.

In 2010, the USEPA implemented a new 1-hour SO_2 standard, which is presented in Table 3.2-2. The USEPA initially designated the SFBAAB as an attainment area for SO_2. Similar to the new federal standard for NO_2, the USEPA established requirements for a new monitoring network to measure SO_2 concentrations beginning in January 2013 (USEPA, 2010). No additional SO_2

monitors are required for the Bay Area because the SFBAAB has never been designated as nonattainment for SO_2, and no State implementation plans or maintenance plans have been prepared for SO_2 (BAAQMD, 2019).

Lead

Lead has a range of adverse neurotoxin health effects and was formerly released into the atmosphere primarily via leaded gasoline products. Leaded gasoline (phased out in the United States beginning in 1973), paint (on older houses, cars), smelters (metal refineries), and manufacture of lead storage batteries have been the primary sources of lead released into the atmosphere. Lead is a highly stable compound that accumulates in the environment and in living organisms. In humans, lead exposures can interfere with the maturation and development of red blood cells, affect liver and kidney functions, and cause nervous system damage (CARB, 2020a). Lead is considered by CARB to be a toxic air contaminant. Any level of lead exposure has adverse health effects. The Bay Area Air Quality Management District (BAAQMD) monitors lead emissions from industrial operations through the toxic air contaminant (TAC) reporting process. In SFBAAB, there are no sources of lead that could exceed the national ambient air-quality standard (BAAQMD, 2019a).

Ambient lead concentrations are only monitored on an as-warranted, site-specific basis in California. On October 15, 2008, the USEPA strengthened the national ambient air quality standard for lead by lowering it from 1.5 $\mu g/m^3$ to 0.15 $\mu g/m^3$ on a rolling three-month average. The USEPA revised the monitoring requirements for lead in December 2010. (Federal Register, 2010).

Regional Topography, Meteorology, and Climate

California is divided geographically into 15 air basins for the purpose of managing the air resources of the state on a regional basis. An air basin generally has similar meteorological and geographic conditions throughout. The project area is located within the Town of Ross and unincorporated areas of Marin County, which is within the SFBAAB, as shown in Figure 3.2-1. The SFBAAB covers roughly 5,340 square miles and consists of Napa, Marin, San Francisco, Contra Costa, Alameda, San Mateo, and Santa Clara Counties, the southern portion of Sonoma County, and the western portion of Solano County. The SFBAAB includes major urbanized areas, encompassing a population of about 7,000,000 (U.S. Census Bureau, 2019). The BAAQMD is the regulatory body responsible for air-quality-related activities in the SFBAAB.

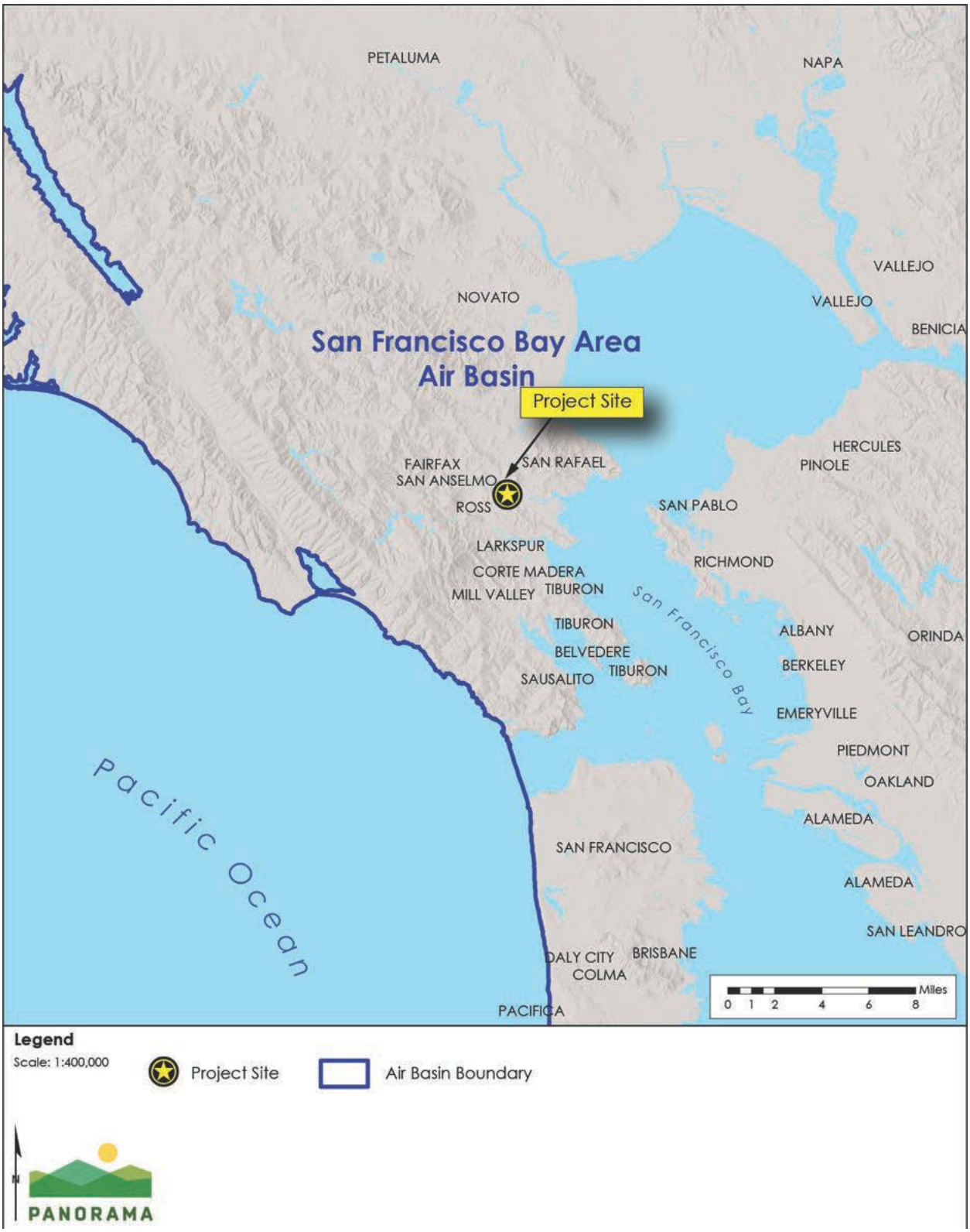
Ambient air quality within SFBAAB is influenced by climatological conditions, topography, and the quantity and type of pollutants released in an area. The major determinants of transport and dilution of a given pollutant are wind, atmospheric stability, terrain, and sunshine for photochemical pollutants. The regional climate in SFBAAB is semi-arid and characterized by mild, dry summers and mild, moderately wet winters (about 90 percent of the annual total rainfall is received in the November to April period), moderate daytime onshore breezes, and moderate humidity. The climate is determined largely by a high-pressure system that is often present over the eastern Pacific Ocean off the West Coast of North America. In winter, the Pacific high-pressure system shifts southward, allowing storms to pass through the region.

During the winter rainy periods, inversions are weak or nonexistent, winds are often moderate, and air pollution potential is very low. During winter periods, when the Pacific high becomes dominant, inversions become strong and often are surface based; winds are light and pollution potential is high. These periods are characterized by winds that flow out of the Central Valley into the Bay Area and often include tule fog. Climate is also affected by the moderating effects of the adjacent oceanic heat reservoir. In summer, when the high-pressure cell is strongest and farthest north, fog forms in the morning, and temperatures are mild. In winter, when the high--pressure cell is weakest and farthest south, occasional rainstorms occur. The air pollution potential is lowest for those regions closest to the San Francisco Bay, due largely to good ventilation and less influx of pollutants from upwind sources. The occurrence of light winds in the evenings and early mornings occasionally results in elevated pollutant levels. Wind flow patterns are controlled by air circulation in the atmosphere, which is affected by air pressure and the variable topography of the coastal areas adjacent to the San Francisco Bay (BAAQMD, 2017a).

Marin County is bounded on the west by the Pacific Ocean, on the east by San Pablo Bay and San Francisco Bay, on the south by the Golden Gate, and on the north by the Petaluma Gap. Most of Marin's population lives in the eastern part of the county, in small, sheltered valleys. These valleys act like a series of miniature air basins. Mount Tamalpais, with a peak of over 2,500 feet, has a substantial effect on climate in central Marin County by blocking the marine layer. In southern Marin, the distance from the ocean is short and elevations are lower, resulting in higher incidence of maritime air in the area. Wind speeds are highest along the west coast of Marin, averaging about 8 to 10 miles per hour. The complex terrain in central Marin creates sufficient friction to slow the air flow. The prevailing wind directions throughout Marin County are generally from the northwest. In the summer months, areas along the coast are usually subject to onshore movement of cool marine air. In the winter, proximity to the ocean keeps the coastal regions relatively warm, with temperatures varying little throughout the year. Coastal temperatures are usually in the high 50s in the winter and the low 60s in the summer. The warmest months tend to be September and October. The eastern side of Marin County has warmer weather than the western side because of its distance from the ocean and because the hills that separate eastern Marin from western Marin occasionally block the flow of the marine air. The temperatures of cities next to the Bay are moderated by the cooling effect of the Bay in the summer and the warming effect of the Bay in the winter. For example, San Rafael experiences average maximum summer temperatures in the low 80s and average minimum winter temperatures in the low 40s (BAAQMD, 2017a).

Air pollution potential is highest in eastern Marin County, where most of population is located in semi-sheltered valleys. In the southeast, the influence of marine air keeps pollution levels low. As development moves further north, there is greater potential for air pollution to build up because the valleys are more sheltered from the sea breeze. While Marin County does not have many polluting industries, the air quality on its eastern side, especially along the U.S. Highway 101 corridor, is affected by emissions from increasing motor vehicle use within and through the county.

Figure 3.2-1 San Francisco Bay Area Air Basin Boundary



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2012, US Geological Survey 2013, California Air Resources Board, Planning and Technical Support Division 2004)

Existing Air Quality

BAAQMD operates a regional monitoring network of air quality monitoring stations to measure the ambient concentrations of criteria pollutants. Existing levels of air pollutants in the study area can be inferred from ambient air quality measurements conducted by BAAQMD at its stations within and close to the project area. The monitoring station that best represents the air quality in the project area is located at 534 4th Street in San Rafael. Table 3.2-3 shows a five-year summary of data collected at this station for ozone, PM_{10}, $PM_{2.5}$, and NO_2. The table also compares the data to CAAQS and NAAQS.

As shown in Table 3.2-3, there were no exceedances of state and national ozone standards between 2014 and 2018. The 24-hour State PM_{10} standard was exceeded on approximately 12 days over the five years, and the 24-hour national PM_{10} standard was exceeded on approximately six days over the five years, but there were no exceedances of the state annual average PM_{10} standard. The national 24-hour $PM_{2.5}$ standard was exceeded on 24 days between 2014 and 2018. There were no measured exceedances of the annual average state or national $PM_{2.5}$ standards or the state or national NO_2 standards. CO, SO_2, and lead were not monitored at the San Rafael station over the five-year study period; however, concentrations of these pollutants are expected to be well below standards in the project area (CARB, 2018).

Toxic Air Contaminants

Health Effects

TACs are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer-causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current California list of TACs includes approximately 200 compounds, including DPM emissions from diesel-fueled engines, which was identified as a TAC by CARB in 1998 (CARB, 2011).

Sensitive Receptors

For the purposes of air quality analysis, sensitive receptors are defined as facilities and land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples include residential areas, schools, hospitals, and daycare centers. The reasons for greater-than-average sensitivity include pre-existing health problems, proximity to emissions sources, and duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, which results in greater exposure to ambient air quality. Sensitive receptors in the project vicinity include residential neighborhoods and schools in the Town of Ross and the unincorporated census-designated place of Kentfield in Marin County.

Table 3.2-3 Air Quality Data Summary (2014–2018) for the Project Vicinity

Pollutant	Monitoring Data by Year				
	2014	2015	2016	2017	2018
Ozone					
Highest 1-hour average (ppm)	0.088	0.081	0.088	0.088	0.072
Days over state standard (0.09 ppm)	0	0	0	0	0
Highest 8-hour average (ppm)	0.068	0.070	0.067	0.063	0.053
Days over state standard (0.070 ppm)	0	0	0	0	0
Days over national standard (0.070 ppm)	0	0	0	0	0
Respirable Particulate Matter (PM_{10})					
Highest 24-hour average – state (µg/m^3)	40.9	42.0	27.0	94.0	166.0
Days over State 24-hour standard (50 µg/m^3)	0	0	0	-	12.2
Highest 24-hour average – national (µg/m^3)	39.0	42.2	26.6	91.5	160.0
Days over national 24-hour standard (150 µg/m^3)	0	0	0	-	6.1
State annual average (Standard: 20 µg/m^3)	14.1	16.1	13.8	-	18.9
Fine Particulate Matter ($PM_{2.5}$)					
Highest 24-hour average – state (µg/m^3)	38.1	36.3	15.6	74.7	167.6
Days over national standard (35 µg/m^3)	1.0	2.0	0.0	8.1	13.0
State annual average (Standard: 12 µg/m^3)	10.8	-	-	9.7	11.1
National annual average (Standard: 12 µg/m^3)	10.8	8.6	6.4	9.7	11.1
Nitrogen Dioxide (NO_2)					
Highest hourly average (ppm)	0.062	0.044	0.045	0.053	0.055
Days over state standard (0.18 ppm)	0	0	0	0	0
Days over national standard (0.1 ppm)	0	0	0	0	0

Notes:

- Indicates that data are not available. Measurements are from the monitoring station at 534 4th Street in San Rafael.

ppm = Parts per million

µg/m^3= Micrograms per cubic meter

Source: (CARB, 2018)

Sensitive land uses within 1,000 feet of the project area include single-family residences along the eastern and western edges of Corte Madera Creek, Ross Elementary School, Kentfield Hospital, Kent Middle School, and the College of Marin. The average distance between Corte

Madera Creek and the closest sensitive receptor is approximately 50 feet. However, residences on Sylvan Lane and along Corte Madera Creek near the left bank of the fish ladder are within 25 feet of the project. Ross Elementary School is approximately 300 feet from the nearest project component, while the College of Marin and Kent Middle School border Corte Madera Creek, within 25 feet of the project area. Kentfield Hospital also borders Corte Madera Creek and is located within 25 feet of the project area. The sensitive receptors within 1,000 feet of the project area are shown on Figure 3.2-2.

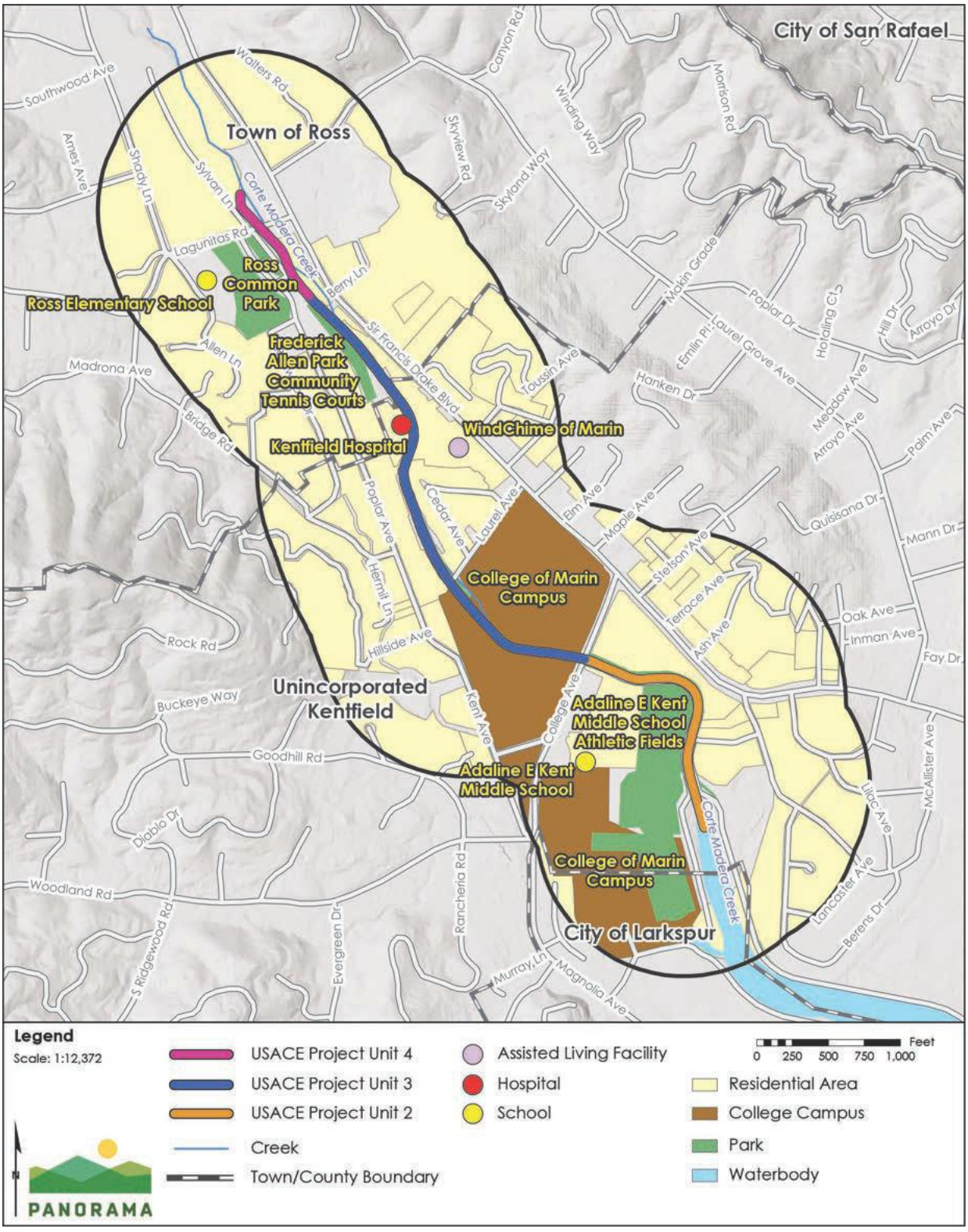
Naturally Occurring Asbestos

Asbestos is a group of naturally occurring fibrous minerals that were commonly used from the mid-1940s to the mid-1980s in building materials because of their high tensile strength and flexibility as well as fire-retardant properties. Asbestos was identified by CARB as a TAC and is classified as a known human carcinogen by state, federal, and international agencies (CARB, 2011). Inhaled asbestos dust in any quantity can contribute to eventual severe health problems such as mesothelioma and other cancers (WHO, 2012). While serpentine soils and bedrock are found in Marin County, none underlie the project area (NRCS, 2017 updated 2019; USGS, 2017 updated 2019).

Dry Deposition of Particulate Matter

Research has shown that trees and plants can remove particulate matter from the air through a process known as dry deposition. Dry deposition is a process by which particles in the atmosphere deposit themselves on a surface, decreasing the atmospheric concentration of particulate matter. The process by which this occurs is particulate matter concentrations in an incoming air flow pass through tree canopies and vegetation, within which a fraction of the particulate matter is removed. A small portion of the incoming airflow is deflected by the canopy instead of passing through it, which can result in locally higher concentrations of particulate matter upwind of a tree. Much of the fine particulates, $PM_{2.5}$, become permanently incorporated into leaf wax or cuticle, while a portion of the coarse fraction is resuspended as a function of wind speed. The remainder of the coarse fraction is eventually washed off to the ground by precipitation. The reduction in particulate matter concentration due to dry deposition is localized to generally within 30 meters (98 feet), with very little reduction in concentration beyond 300 meters (984 feet) of the tree or trees. The rate of dry deposition is greater in areas with higher atmospheric concentrations of particulate matter and associated with larger leaf surface area. Other factors that affect deposition include wind speed, temperature, and relative humidity (McDonald, et al., 2016). Based on studies, the percent air quality improvement estimated to be provided by urban trees due to dry deposition and other processes ranges from 0.2 to 1.0 percent for coarse particulates, depending upon the location, due to variation in weather, tree cover, and tree species (Nowak, Crane, & Stevens, 2006).

Figure 3.2-2 Sensitive Receptors within 1,000 Feet of the Project Area



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2012, US Geological Survey 2013, Esri, United States Geological Survey, U.S. Geographic Names Information System 2020)

3.2.4 Regulatory Setting

Federal and State Regulations

United States Environmental Protection Agency – Clean Air Act

The USEPA is responsible for enforcing the federal Clean Air Act (CAA) and the 1990 amendments. The NAAQS, as previously discussed, were established by the federal CAA of 1970 and amended in 1977 and 1990. The USEPA is responsible for implementing programs established by the federal CAA, such as establishing and reviewing the NAAQS for the following air pollutants: CO, ozone, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The federal CAA also requires the USEPA to designate areas (counties or air basins) as attainment or non-attainment with respect to each criteria pollutant, depending on whether the area meets the NAAQS. As part of its enforcement responsibilities, the USEPA requires each state with non-attainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, State, and local plan components and regulations to identify specific measures to reduce pollution in non-attainment areas, using a combination of performance standards and market-based programs. The project activities must comply with the thresholds set by the local air district, which are intended to meet NAAQS and achieve the goals of the SIP. Air quality within the SFBAAB does not attain the federal standards for ozone or $PM_{2.5}$.

California Air Resources Board – California Clean Air Act

CARB oversees air quality planning and control throughout California. It is primarily responsible for ensuring implementation of the 1989 amendments to the California Clean Air Act (CCAA), responding to the federal CAA requirements, and regulating emissions from motor vehicles and consumer products within the state. CARB is the agency delegated responsibility for preparing and submitting the SIP to the USEPA. CARB also oversees air quality policies in California and has established CAAQS for NO_2, CO, PM_{10}, $PM_{2.5}$, SO_2, ozone, lead, sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Most of the CAAQS are at least as stringent (and typically more stringent) as the NAAQS. Similar to the USEPA, CARB designates counties or air basins in California as attainment or nonattainment with respect to the CAAQS. Air quality within the SFBAAB does not attain the state standards for ozone, PM_{10}, or $PM_{2.5}$. Activities associated with implementation of the project must comply with the thresholds set by the BAAQMD, which are intended to meet the CAAQS.

Regional Regulations

Bay Area Air Quality Management District – Overview

BAAQMD maintains air quality conditions in the project area in Marin County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean-air strategy of BAAQMD includes the preparation of plans and programs for the attainment of ambient-air-quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. BAAQMD also inspects stationary sources, responds to citizen complaints,

monitors ambient-air quality and meteorological conditions, and implements other programs and regulations required by the CAA and CCAA.

As mentioned above, BAAQMD adopts rules and regulations. All projects, including the project analyzed in this EIR, are subject to BAAQMD's rules and regulations in effect at the time of construction or implementation. Specific plans applicable to the activities associated with the project or alternatives being considered may include, but are not limited to, the regulations listed below (BAAQMD, 2019b).

Bay Area Air Quality Management District – Bay Area 2001 Ozone Attainment Plan
BAAQMD prepared the San Francisco Bay Area 2001 Ozone Attainment Plan for the one-hour National Ozone Standard (2001 Ozone Attainment Plan) to reduce ozone-forming emissions in SFBAAB by implementing emissions-reductions measures for stationary, area, and mobile sources, such as reductions in off-gassing of architectural coatings and organic liquids, low-emission vehicles, expansion of express bus systems, and bicycle and pedestrian programs. The 2001 Ozone Attainment Plan was adopted on November 1, 2001, as a revision to the California SIP (BAAQMD, 2001). The 2001 Ozone Attainment Plan identified proposed control measures for stationary, area, and mobile sources to improve air quality and re-attain the national 1-hour ozone standard in SFBAAB. BAAQMD does not have the jurisdiction to adopt mobile-source control measures. Mobile-source control measures were proposed for CARB to review and adopt as part of the California SIP.

Bay Area Air Quality Management District – 2017 Clean Air Plan
BAAQMD adopted the 2017 Clean Air Plan (CAP) to address state nonattainment in SFBAAB for both the one- and eight-hour ozone standards. The 2017 CAP details a control strategy to address ozone precursors (typically ROGs and NO_x), particulate matter, and TACs. The 85 control measures are categorized into nine economic sectors, including transportation, energy, agriculture, and natural and working lands (BAAQMD, 2017a). The 2017 CAP would apply to the project.

Local Plans and Policies

Marin County Countywide Plan
The following goals and policies in the Marin Countywide Plan are relevant to the project (Marin County , 2007):

Goal AIR-1: Improved Regional Air Quality. Promote planning and programs that result in the reduction of airborne pollutants measured within the county and the Bay Area.

> ***Policy AIR-1.2: Meet Air Quality Standards***. Seek to attain or exceed the more stringent of federal or State Ambient Air Quality Standards for each measured pollutant.
>
> ***Policy AIR-1.3: Require Mitigation of Air Quality Impacts***. Require projects that generate potentially significant levels of air pollutants, such as quarry, landfill operations, or large construction projects, to incorporate best available air quality mitigation in the project design.

Implementing Program AIR-1.g: Require control measures for construction and agricultural activity. Require reasonable and feasible measures to control particulate emissions (PM-10 and PM-2.5) at construction sites and during agricultural tilling activity, pursuant to the recommendations in the BAAQMD CEQA Guidelines, which may include the following:

1. Watering active construction or agricultural tilling areas.
2. Covering hauled materials.
3. Paving or watering vehicle access roads.
4. Sweeping paved and staging areas.

Goal PFS-4: Efficient Processing and Reduced Landfill Disposal of Solid Waste. Minimize, treat, and safely process solid waste materials in a manner that protects natural resources from pollution while planning for the eventual reuse or recycling of discarded material to achieve zero waste.

Policy PFS-4.4: Promote Regulatory Efforts. Support State legislative or regulatory efforts that will aid in achieving zero waste.

Implementing Program PFS-4.b: Divert Construction Waste. Continue to implement the construction and demolition recycling waste ordinance to divert construction waste from landfills.

3.2.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it 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 nonattainment under an applicable federal or state ambient air quality standard;
c. Expose sensitive receptors to substantial pollutant concentrations; or
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Significance Thresholds

BAAQMD released the 2017 Air Quality CEQA Guidelines,[1] which included thresholds of significance, in May 2017 to assist lead agencies in determining when air-quality emissions would be considered significant under CEQA. Table 3.2-4 identifies quantitative criteria air pollutant significance thresholds and is followed by a discussion of each threshold. Projects that would result in criteria pollutant emissions below these significance thresholds would not violate an air quality standard, contribute substantially to an air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants within the SFBAAB. Both sets of thresholds (average daily and maximum annual) apply to operational emissions from a given project. Construction emissions are assessed solely with respect to the average daily thresholds, pursuant to BAAQMD guidance, because of the temporary nature of construction-related emissions (BAAQMD, 2017a).

Any project that would have the potential to expose sensitive receptors to substantial levels of toxic air contaminants such that it would result in an incremental increase in cancer or non cancer health risk, or in an increase in ambient PM2.5 concentrations in excess of the thresholds identified in Table 3.2 4, would be considered to have a significant impact on sensitive receptors (BAAQMD, 2017a). The PM2.5 threshold for construction is applied to exhaust emissions only and does not include concentrations of fugitive dust (BAAQMD, 2017a). Depending on the distance separating construction activities from the nearest sensitive receptors and the concentration of construction DPM and PM2.5 exhaust emissions generated by the project elements, health-risk impacts on sensitive receptors may occur.

The thresholds of significance for criteria air pollutants and health risk are based on substantial evidence presented in Appendix D of the BAAQMD CEQA Air Quality Guidelines and BAAQMD's Revised Draft Options and Justification Report concerning CEQA thresholds (BAAQMD, 2017a; BAAQMD, 2009). Based on the substantial technical research that went into the preparation of the thresholds by BAAQMD, this analysis uses the BAAQMD thresholds and the methodologies in its 2017 Air Quality CEQA Guidelines to determine the significance of the project's impacts on air quality and sensitive receptors.

Approach to Impact Analysis

The evaluation of potential impacts to regional and local air quality that may result from the construction and long-term operations of the project is described below. Additional details on the air quality modeling are provided in Appendix C.

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[1] A subsequent update of BAAQMD's Air Quality CEQA Guidelines will be released to address outdated references, links, analytical methodologies, or other technical information that may be in the 2017 Air Quality CEQA Guidelines or Thresholds Justification Report.

Table 3.2-4 Significance Thresholds

Pollutant	Construction-Related	Operations-Related	
	Average Daily Emissions (pounds per day)	Average Daily Emissions (pounds per day)	Maximum Annual Emissions (tons per year)
ROG	54	54	10
NOx	54	54	10
PM_{10}	82 (exhaust)	85	15
$PM_{2.5}$	54 (exhaust)	54	10
PM_{10} / $PM_{2.5}$ (fugitive dust)	Construction dust ordinance or other best management practices to control fugitive dust emissions	Not applicable	
Risk and hazards for new sources and receptors (individual project) *	Same as operational thresholds **	Increased cancer risk of >10.0 in a million Increased non-cancer risk of > 1.0 Hazard Index (Chronic or Acute) Ambient $PM_{2.5}$ increase: > 0.3 µg/m^3 annual average Zone of Influence: 1,000-foot radius from property line of source or receptor	
Risk and Hazards for new sources and receptors (cumulative threshold) *	Same as operational thresholds **	Cancer: > 100 in a million (from all local sources) Non-cancer: > 10.0 Hazard Index (from all local sources) (Chronic) $PM_{2.5}$: > 0.8 µg/m^3 annual average (from all local sources) Zone of Influence: 1,000-foot radius from property line of source or receptor	

Notes:

*The receptor thresholds were the subject of litigation in California Building Industry Association v. Bay Area Air Quality Management District (2015) 62 Cal. 4th 369.

** The BAAQMD recommends that for construction projects that are less than one-year duration, Lead Agencies should annualize impacts over the scope of actual days that peak impacts are to occur, rather than the full year.

Source: (BAAQMD, 2017a)

Criteria Air Pollutant Assessment

Overview

By definition, regional air pollution is largely a cumulative impact in that no single project is sufficient in size to, by itself, result in nonattainment of air quality standards. Instead, a project's individual emissions are considered to contribute to the existing, cumulative air quality conditions. If a project's contribution to cumulative air quality conditions is considerable, then the project's impact on air quality would be considered significant (BAAQMD, 2017a).

The potential for a project to result in a cumulatively considerable net increase in criteria air pollutants that may contribute to an existing or projected air quality violation is based on the federal and state Clean Air Acts' emissions limits for stationary sources. To ensure that new stationary sources do not cause or contribute to a violation of an air quality standard, BAAQMD Regulation 2, Rule 2, requires that any new source that emits criteria air pollutants above a specified emissions limit must offset those emissions.

Construction Emissions

Average daily emissions during construction are calculated from estimated construction activities developed by the project engineers and applying the appropriate emissions factors for each source of emissions. Equipment, fugitive dust from disturbance, and worker-trip emissions were estimated for the project using the California Emissions Estimator Model (CalEEMod) (version 2016.3.2), which is a statewide land-use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify criteria pollutant emissions from a variety of projects. CalEEMod was developed in collaboration with the air districts of California. Regional data (e.g., emission factors, trip lengths, meteorology, source inventory) have been provided by the various California air districts to account for local requirements and conditions. The model is considered to be an accurate and comprehensive tool for quantifying air quality impact from projects throughout California and is recommended by the BAAQMD.[2] Pollutant emissions from truck trips were estimated based on the emission factors developed in the EMission FACtors 2017 (EMFAC2017) model and USEPA AP-42 methodologies.

Vehicle-exhaust-emission factors (including running, evaporative, starting, idling, brake-wear, and tire-wear emissions) were derived based on modeling results from the EMFAC2017 model developed by the CARB (CARB, 2017).[3] Fugitive dust emissions from trucks traveling on paved roads were estimated based on the USEPA AP-42 methodologies (USEPA, 2006; USEPA, 2011).

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[2] California Emissions Estimator Model is available at: http://caleemod.com/.

[3] On September 19, 2019, the USEPA and the National Highway Traffic Safety Administration (NHTSA) enacted the "Safer, Affordable, Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program," which they had proposed in 2018 to roll back corporate annual fuel economy standards issued during the Obama Administration. The One National Program was immediately challenged in federal court. The day after it was issued, California's Attorney General, Xavier Bercerra, with 23 states and the District of Columbia, Los Angeles, and New York City, sued the Trump Administration, arguing that the "preemption rule" is "unlawful, disregards the National Environmental Policy Act and is arbitrary and capricious, among other complaints." Observers predict that the legal battle will go all the way to the Supreme Court, which means that the rule will be tied up in litigation for the next few years. Although CARB has issued EMFAC adjustment factors for gasoline light-duty vehicle emissions, these adjustment factors are very small (less than 1.2 percent by 2028). Despite the SAFE vehicles rule undergoing litigation, and since the adjustment factors are very small, the impact of the SAFE vehicles rule was accounted for quantitatively in this analysis.

Detailed calculations are provided in Appendix C of this Draft EIR. Average daily emissions represent the emissions that would occur for every day of project construction in the project area in 2022, over a period of approximately seven months. The average daily emissions are compared to the BAAQMD average daily emissions thresholds.

Operational Emissions

Operational emissions were estimated for the project using CalEEMod software for the pumps and 150-kW backup generator. Average daily operational emissions represent total emissions that would occur from operation of the pump and generator divided by 365 total days each year. The average daily emissions are compared to the BAAQMD average daily emissions thresholds.

Other Criteria Pollutants

Regional concentrations of CO in the Bay Area have not exceeded the state standards in the past 11 years, and SO_2 concentrations have never exceeded the standards. The primary source of CO emissions from development projects is vehicle traffic. Construction-related SO_2 emissions represent a negligible portion of the total basin-wide emissions, and construction-related CO emissions represent less than five percent of the total basin-wide CO emissions. As discussed previously, the SFBAAB is in attainment for both CO and SO_2. Furthermore, the BAAQMD has demonstrated, based on modeling, that to exceed the California ambient air quality standard of 9.0 ppm (eight-hour average) or 20 ppm (one-hour average) for CO, project traffic in addition to existing traffic would need to exceed 44,000 vehicles per hour at affected intersections (or 24,000 vehicles per hour where vertical and/or horizontal mixing is limited).[4] The project would not generate any new vehicle trips outside of construction vehicles because it does not have an operational component. Maximum average daily construction vehicle trips during construction would be significantly less than 24,000 vehicles per hour. Therefore, given the SFBAAB's attainment status and the limited CO and SO_2 emissions that could result from the project, the project would not result in a cumulatively considerable net increase in CO or SO_2, and a quantitative analysis relative to these pollutants is not required.

Toxic Air Contaminants Assessment

The health risk assessment was conducted in accordance with the Office of Environmental Health Hazards Assessment (OEHHA) Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA, 2015), CARB and California Air Pollution Control Officers Association Risk Management Guidance for Stationary Sources of Air Toxics (CARB and CAPCOA, 2015), and BAAQMD Air Toxics NSR Program Health Risk Assessment Guidelines (BAAQMD, 2016). Exposure of nearby sensitive receptors to TACs from project

[4] For a land-use project type, the BAAQMD CEQA Air Quality Guidelines state that a proposed project would result in a less-than-significant impact on localized CO concentrations if the project would not increase traffic at affected intersections to more than 44,000 vehicles per hour.

construction and operation was estimated using the USEPA's AERMOD (atmospheric dispersion modeling system) (USEPA, 2019). Dispersion modeling with the emissions produced by CalEEMod was conducted using AERMOD and hourly meteorological data from the most representative monitoring station to predict TAC and fine particulate matter exposures associated with the proposed project. The cancer risks associated with modeled particulate matter concentrations were computed following the BAAQMD risk management policy guidance.

The BAAQMD has identified a distance of 1,000 feet from the source to the closest sensitive receptor locations within which community health risk thresholds would be applicable to gauge the significance of health risk-related impacts. Impacts are quantified for the maximally impacted sensitive receptors. The 1,000-foot radius used herein is a conservative metric to identify sensitive receptors in the vicinity of the project area. It follows that the impact analysis examines existing baseline conditions and foreseeable future conditions. Therefore, an HRA was conducted in accordance with OEHHA guidance (2015) to estimate the maximum cancer risk resulting from exposure to DPM associated with the proposed project. Refer to Appendix C for further details on the methodology and calculation sheets that show all assumptions used to estimate the cancer risk and chronic hazard index associated with the proposed project.

3.2.6 Impact Discussion

Impacts Analyzed

	Significance Determination
Impact 3.2-1: The project would not conflict with or obstruct implementation of the applicable air quality plan.	**Construction: Less than Significant** **Operation and Maintenance: Less than Significant**

Construction

The BAAQMD is required, pursuant to the Clean Air Act, to reduce emissions of criteria pollutants for which the SFBAAB is in nonattainment of the CAAQS (i.e., ozone, PM_{10}, and $PM_{2.5}$) and NAAQS (i.e., ozone and $PM_{2.5}$). The most recently adopted air quality plan for the air basin is the 2017 Clean Air Plan. The 2017 Clean Air Plan is a road map that demonstrates how the air basin will achieve compliance with the state ozone standards as expeditiously as practicable and how the region will reduce the transport of ozone and ozone precursors to neighboring air basins. The BAAQMD's 2017 Clean Air Plan contains a comprehensive list of pollution control strategies directed at reducing emissions and achieving the CAAQS and NAAQS. Projects, uses, and activities that are consistent with the applicable growth projections and control strategies used in the development of the Clean Air Plan would not jeopardize attainment of the air quality levels identified in the Clean Air Plan. In determining consistency with the 2017 Clean Air Plan, this analysis considers whether the project would: (1) support the primary goals of the 2017 Clean Air Plan, (2) include applicable control measures from the 2017 Clean Air Plan, and (3) avoid disrupting or hindering implementation of control measures identified in the 2017 Clean Air Plan (BAAQMD, 2017).

The primary goals of the 2017 Clean Air Plan are to: (1) protect air quality and health at the regional and local scale; (2) eliminate disparities among Bay Area communities in cancer health risk from toxic air contaminants; and (3) protect the climate by reducing greenhouse gas emissions. To meet the primary goals, the 2017 Clean Air Plan recommends specific control measures and actions. These control measures are grouped into various categories that include stationary and area source measures, mobile source measures, transportation control measures, land use measures, and energy and climate measures. To this end, the 2017 Clean Air Plan includes 85 control measures aimed at reducing air pollution in the air basin.

Examples of a project that could cause the disruption or delay of the 2017 Clean Air Plan control measures are projects that would preclude the extension of a transit line or bike path, or projects that propose excessive parking beyond parking requirements. Some temporary closures of the pathway along the creek would occur during construction and for up to seven months at Frederick Allen Park, but in the long term, the project would not permanently preclude the extension of a transit line or a bike path or any other transit improvement, nor would it alter the use of surrounding areas. This being the case, construction of the project would not disrupt or hinder implementation of control measures identified in the 2017 Clean Air Plan.

Construction crew members would commute to and from the project site, and heavy equipment would be used during construction of the project. The measures most applicable to the project construction are transportation control measures. The 2017 Clean Air Plan includes several transportation control measures applicable to these activities, including the following:

- Provide incentives to promote ridesharing (TR8).
- Provide incentives to purchase new trucks that exceed NOx emission standards, hybrid trucks, or zero-emission trucks (TR19).
- Deploy construction and farm equipment with Tier 3 or 4 off-road engines (TR22).
- Encourage local governments to adopt tree planting ordinances (NW2).

The applicable transportation control measures are voluntary incentive measures and do not require vehicle upgrades or retrofits. The proposed use of vehicles and equipment, and the proposed tree planting, would not conflict with these programs. Therefore, the project would not conflict with or obstruct implementation of the control measures identified to achieve the goals of the 2017 Clean Air Plan.

Operation of vehicles and equipment during project construction would emit diesel particulate matter and criteria air pollutants. Construction activities, particularly during demolition and grading, would also temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. As further discussed under Impact 3.2-2, no exceedances of the criteria air pollutant significance thresholds would occur, and the project would comply with the requirements of the Clean Construction and Dust Control Ordinances. Therefore, no conflict would occur from exceedance of the criteria air pollutant significance thresholds, and the project would support the primary goals set forth in the 2017 Clean Air Plan. The project's impact with respect to GHGs are discussed in Section 3.7 Greenhouse Gas Emissions, which demonstrates that the project would comply with the 2017 Clean Air Plan.

For the reasons described above, the project construction would not interfere with implementation of the 2017 Clean Air Plan. The project would be consistent with the applicable air quality plan that demonstrates how the region will improve ambient air quality and achieve the state and federal ambient air quality standards. The impact from conflict or obstruction of an applicable air quality plan would be less than significant because the project would be consistent with the applicable air quality plan.

Operation and Maintenance

The 2017 Clean Air Plan does not contain any measures specific to flood control activities and, therefore, no inconsistency with the 2017 Clean Air Plan has been identified. With no specific control measures from the 2017 Clean Air Plan applicable to flood control and management programs, the project would not be considered to hinder implementation of any of the 2017 Clean Air Plan control measures.

Project operation and maintenance would involve activities similar to existing conditions including periodic debris or sediment removal in the creek channel, fish pools and stormwater pump station, vegetation management, and annual routine inspections. A new backup generator would be installed to provide power to the pump station in the event of power failure. One stationary source control measure applies regarding reducing emissions of diesel particulate matter and black carbon from emergency backup generators in accordance with Rule 11-18 (SS32). However, the adopted Rule 11-18 exempts generators used only for emergency use. As further discussed under Impact 3.2-2, no exceedances of the criteria air pollutant significance thresholds would occur. Therefore, no conflict would occur from exceedance of the criteria air pollutant significance thresholds and the project would support the primary goals set forth in the 2017 Clean Air Plan. For the reasons described above, the project would not interfere with implementation of the 2017 Clean Air Plan and the impact would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.2-2: The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard.	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: Less than Significant

Construction

Construction activities associated with the project would involve the use of diesel-powered construction equipment, such as graders, excavators, and loaders that would generate exhaust in the form of both criteria air pollutants and criteria air pollutant precursors. In addition, exhaust emissions would be generated from vehicle trips associated with material delivery/debris hauling and commuting workers. Construction activities would also generate fugitive dust (including PM_{10} and $PM_{2.5}$) during excavation, grading, spoils placement, and vehicle travel.

The project design engineer provided information on:

- Duration of each construction phase for each project element;
- Estimated construction equipment requirements for each construction phase for each of the project elements; and
- Estimated number of on-road truck trips for material and equipment delivery, soil off-haul truck trips, water truck trips, and other miscellaneous truck trips.

Construction is assumed to begin in April 2022, with several overlapping phases. Construction of the project is anticipated to take approximately seven months (167 total workdays) at Frederick Allen Park and less time in other areas (refer to Table 2.6-5 and Appendix C for details). Construction-related emissions for each project element is a function of the construction activity involved, including the type, size, and amount of construction equipment used, duration of equipment use, the amount of required auto/light-truck and heavy truck trips, and the average mileage of those trips. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of construction activity, and prevailing weather conditions.

Table 3.2-5 presents unmitigated criteria pollutant emissions generated by construction as compared to the BAAQMD construction thresholds. Refer to Appendix C for the assumptions and calculation sheets that were used to estimate the daily average emissions that would be associated with construction of the proposed project. As shown in the table, emissions would not exceed the BAAQMD thresholds.

In addition to exhaust emissions, emissions of fugitive dust would also be generated by construction activities associated with grading and earth disturbance as well as vehicle travel. The BAAQMD CEQA Air Quality Guidelines requires control of fugitive dust through BMPs in order to consider impacts from fugitive dust emissions less than significant. BAAQMD does not have a quantitative standard for fugitive dust from construction activities. Studies have shown that the application of best management practices (BMPs) at construction sites significantly controls fugitive dust (Countess Environmental, 2006), and individual measures have been shown to reduce fugitive dust by anywhere from 30 to 90 percent (BAAQMD, 2009). The County Development Code includes BAAQMD's fugitive dust Basic Control Measures, but work within Unit 4 and Frederick Allen Park is located within the Town of Ross where the BAAQMD fugitive dust Basic Control Measures have not been adopted into the local regulations.

Table 3.2-5 Estimated Construction Emissions (Pounds)

Unit	Project Element	ROG	NOx	PM_{10} (exhaust)	$PM_{2.5}$ (exhaust)
Unit 4	Fish ladder removal and Unit 4 grading	83	599	23	21
Unit 3	Frederick Allen Park	141	1,269	46	39
	Fish pools	178	1,225	48	46

Unit	Project Element	ROG	NOx	PM_{10} (exhaust)	$PM_{2.5}$ (exhaust)
	Floodwall (Segment #3)	18	170	7	5
	Stormwater pump station	42	338	13	11
	Floodwall (Segment #2)	9	74	3	3
Unit 2	Floodwall (Segment #1)	15	129	6	4
	Lower College of Marin concrete channel removal	82	796	28	23
Total construction emissions		**569**	**4,598**	**174**	**152**
Average daily construction emissions (based on 167 workdays)		**3.4**	**27.5**	**1.0**	**0.9**
BAAQMD significance thresholds		54	54	82	54
Threshold exceeded?		No	No	No	No

Note:
Numbers may not add up due to rounding.

Because the proposed project has not proposed specific dust control measures to comply with BAAQMD CEQA Air Quality Guidelines, the impact associated with fugitive dust emissions in the Town of Ross could be significant. **Mitigation Measure 3.2-2: Fugitive Dust Measures** requires implementation of the BAAQMD's fugitive dust Basic Control Measures, which would meet BAAQMD CEQA Air Quality Guidelines requirements for fugitive dust emissions and reduce impacts to less than significant. The impact from construction emissions would be less than significant with mitigation because emissions would not exceed the BAAQMD thresholds and the mitigation measure would require implementation of the BAAQMD fugitive dust Basic Control Measures across the entire project.

Operation and Maintenance

Following construction, the operation and maintenance of the project elements would be very similar to current management practices in the current creek channel. These activities would involve periodic debris or sediment removal in the creek channel, fish pools and stormwater pump station, vegetation management, and annual routine inspections. The lower Unit 2 restoration would be designed to be a natural and self-maintaining creek ecosystem. No maintenance would be necessary. Vegetation maintenance activities may be slightly higher than existing conditions for a few years after construction to remove invasive weeds and maintain temporary irrigation but in the long term are assumed to be no greater than existing conditions.

Operation and maintenance activities would generally be similar to existing conditions except for operation of the proposed pump station and testing of the new backup generator. The new pump station would house a 40 hp pump powered through an electrical connection to the grid and a 150-kW backup generator in the event of a power outage. The backup generator is

assumed to be tested for 50 hours a year in accordance with the California Code of Regulations limit on annual operation of emergency generators for testing and maintenance (CCR § 93115.6 (3)(A)). Table 3.2-6 presents unmitigated operational criteria air pollutant emissions compared to the BAAQMD operational thresholds. As shown in the table, no emissions would exceed the BAAQMD thresholds. This being the case, operational emissions would not result in exceedance of an air quality standard or contribute substantially to an existing or projected air quality violation and the impact would be less than significant.

Table 3.2-6 Estimated Average Daily Operational Emissions (Pounds/Day)

Unit	Project Element	ROG	NOx	PM_{10}	$PM_{2.5}$
Unit 4	Stormwater pump station	0.05	0.13	0.01	0.01
BAAQMD significance thresholds		54	54	82	54
Threshold exceeded?		No	No	No	No

Note:

The emission calculation conservatively assumed up to 50 hours of operation for testing the backup generator and operation of the 40 hp pumps for up to 365 days a year. Realistically, the pumps would only operate during storm events.

Mitigation: Implement Mitigation Measure 3.2-2.

Mitigation Measure 3.2-2: Fugitive Dust Measures.

To limit dust, criteria pollutants, and precursor emissions associated with construction, the following BAAQMD-recommended fugitive dust control measures shall be implemented and included in all contract specifications for components constructed under the project:

- All exposed surfaces (e.g., unpaved parking areas, unpaved staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

- Construction equipment shall be properly maintained by a certified mechanic.
- A publicly visible sign shall be posted with the telephone number and person to contact at the District regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

Significance after Mitigation: Mitigation Measure 3.2-2 would require the implementation of BAAQMD's fugitive dust Basic Control Measures, which would reduce fugitive dust emissions during construction to a less-than-significant level.

	Significance Determination
	Construction: Less than Significant with Mitigation
Impact 3.2-3: The project would not expose sensitive receptors to substantial pollutant concentrations.	**Operation and Maintenance: Less than Significant**

Overview

Project construction activities would result in short-term emissions of DPM and other TACs from operation of heavy equipment and vehicles. Operational activities would generate some TAC emissions from the new emergency generator. Impacts on the health of sensitive receptors related to particulate matter are analyzed with other TAC emissions below.

Toxic Air Contaminants

Construction

Construction activities associated with the project would result in the short-term generation of DPM emissions from the use of off-road diesel equipment required to construct the proposed project elements and from construction material deliveries and debris/spoils removal using on-road heavy-duty trucks. Construction activities associated with the project would be transitory and short term in nature, occurring for seven months. Table 3.2-8 presents unmitigated cancer risk, chronic hazard index, and $PM_{2.5}$ exhaust concentrations associated with construction emissions and compares these emissions to the BAAQMD thresholds. Unmitigated construction activities would result in exposure of sensitive receptors to DPM emissions, causing potentially significant health risk impacts. The construction activities conducted in Unit 4 and the northern portion of Unit 3 would pose the greatest health risk because work at this site is surrounded by residential sensitive receptors, with private residential property adjacent to the work area. As shown in Table 3.2-7, cancer risk and maximum acute hazard index exceeds the BAAQMD thresholds, which constitutes a significant impact. The maximum chronic hazard index and annual average $PM_{2.5}$ exhaust concentrations would be less than the BAAQMD's significance thresholds. The short-term health risk impact on sensitive receptors would be potentially significant.

Mitigation Measure 3.2-3: Engine Controls for Construction Equipment requires that all off-road diesel-powered equipment (more than 25 horsepower) used for the project would be equipped with engines that achieve USEPA Tier 3 and Diesel Particulate Filter level 3 emissions standards. This requirement applies to all phases of construction, with the exception of the Lower College of Marin concrete channel removal due to the lower pollutant concentrations associated with those construction activities and the greater distance between those activities and sensitive receptors. Table 3.2-8 presents a summary of the mitigated health risk at the maximally exposed receptor associated with construction emissions. As shown, the cancer risk, chronic hazard index, and annual average $PM_{2.5}$ exhaust concentrations would be less than the BAAQMD's significance thresholds. Therefore, the impact on sensitive receptors would be reduced to less than significant with mitigation.

Table 3.2-7 Estimated Unmitigated Construction Health Risk

Receptor	Maximum Cancer Risk (in 1 million)	Chronic Hazard Index	Acute Hazard Index	Annual Average $PM_{2.5}$ Exhaust Concentrations ($\mu g/m^3$)
Maximally exposed individual receptor[a]	16.5	0.039	--	0.12
Maximally exposed residential receptor[b]	11.9	0.028	59	--
BAAQMD significance thresholds	10.0	1.0	1.0	0.30
Threshold exceeded?	**Yes**	No	**Yes**	No

Notes:

[a] This receptor location is the location where the maximum health risk would occur based on modeling. No real-world sensitive receptors occur at this location.

[b] This receptor location is the nearest real-world sensitive receptor.

Table 3.2-8 Estimated Mitigated Construction Health Risk

Receptor	Maximum Cancer Risk (in 1 million)	Chronic Hazard Index	Acute Hazard Index	Annual Average $PM_{2.5}$ Exhaust Concentrations ($\mu g/m^3$)
Maximally exposed individual receptor[a]	4.4	0.010	--	0.03
Maximally exposed residential receptor[b]	3.2	0.007	0.61[c]	--
BAAQMD significance thresholds	10.0	1.0	1.0	0.30
Threshold exceeded?	No	No	No	No

Receptor	Maximum Cancer Risk (in 1 million)	Chronic Hazard Index	Acute Hazard Index	Annual Average $PM_{2.5}$ Exhaust Concentrations ($\mu g/m^3$)

Notes:

[a] This receptor location is the location where the maximum health risk would occur based on modeling. No real-world sensitive receptor occurs at this location.

[b] This receptor location is the nearest real-world sensitive receptor.

[c] The maximally exposed residential receptor is a different residence for acute hazard index with mitigation.

Operation and Maintenance

After construction, maintenance activities would be conducted in the project area. Such activities include vegetation management, sediment and debris removal, and stormwater pump station and floodwall maintenance, which would be similar to existing maintenance activities, resulting in no measurable change in TAC emissions associated with those activities. Operation of the new backup generator during testing and maintenance would generate TAC emissions. Emergency use of the generator is not considered in the analysis. The District would acquire a permit from BAAQMD and comply with permit conditions for the new generator, which could include application of best available control technology and not exceeding 50 hours of testing per year (BAAQMD, 2007; BAAQMD, 2017). The health risk assessment analyzed potential excess lifetime cancer risks and $PM_{2.5}$ concentrations as well as chronic and acute non-cancer health effects resulting from project operation, as shown in Table 3.2-9. As shown, no exceedances of the BAAQMD significance thresholds would occur, and the impact to sensitive receptors would be less than significant.

Table 3.2-9 Estimated Unmitigated Operational Health Risk

Receptor	Maximum Cancer Risk (in 1 million)	Chronic Hazard Index	Acute Hazard Index	Annual Average $PM_{2.5}$ Exhaust Concentrations ($\mu g/m^3$)
Maximally exposed individual receptor[a]	0.76	0.0002	0.06	0.001
BAAQMD significance thresholds	10.0	1.0	1.0	0.30
Threshold exceeded?	No	No	No	No

Note:

[a] This receptor location is the location where the maximum health risk would occur based on modeling. No real-world sensitive receptor occurs at this location, but persons may be present during generator testing.

Other Localized Pollutant Concentrations

CO emissions generated from gas-powered truck traffic and other combustion equipment during construction activities could result in CO hotspots, or localized concentrations of CO.

Diesel-powered vehicles and equipment, such as those used for project construction, do not emit CO in the same concentrations and are less likely to cause a CO hotspot. This being the case, congested intersections with a large volume of traffic have the greatest potential to cause high, localized concentrations of CO, which could affect public health. On-road motor vehicle exhaust in metropolitan areas accounts for as much as 75 percent of CO emissions based on data collected across the nation. CO emissions and concentrations have been continually decreasing and have not exceeded the eight-hour federal or state air quality standard at any monitoring location, nationwide,[5] in decades (USEPA, 2017).

The proposed project would generate a relatively small amount of temporary construction traffic and no net new operational traffic. The 2017 CEQA Air Quality Guidelines indicate that a project would significantly affect CO levels if project traffic would increase traffic volumes at intersections to more than 44,000 vehicles per hour. The daily traffic volume at the nearest high-volume road, Sir Francis Drake Boulevard, varies from 22,500 vehicles on the two-lane section between Town of Ross limits and Elm Avenue, to 31,500 vehicles on the four-lane section between Elm Avenue and McAllister Avenue (LSA, 2018). Vehicles used during construction of the proposed project would generate a maximum of 465 one-way truck and worker trips per day (refer to Section 3.13 Transportation and Circulation). Traffic would increase by an average of up to 94 trips (including construction-worker vehicle trips and truck trips) per day during construction of the proposed project and would not cause traffic levels to exceed 44,000 vehicles per hour at any intersection. The other mobile sources associated with the proposed project, such as off-road equipment, would be operated intermittently and in such a manner that CO emissions would not be concentrated in any one area for a long duration. Consequently, construction of the proposed project would not result in CO concentrations in excess of the state or federal health-protective air quality standards in the air basin and, therefore, would not expose sensitive receptors to significant pollutant concentrations that could result in adverse health effects.

Dry Deposition of Particulate Matter

The project area is currently vegetated with trees and channelized along certain portions. No substantial sources of particulate pollution occur within the project area aside from the temporary construction activities and one new emergency generator (refer to the health risk assessment above for the risk associated with these project activities).

Concentrations of particulates due to dry deposition vary depending upon many factors, including wind direction, tree species (due to leaf surface area, density of canopy, and size of canopy), and size of the particle. For example, if vegetation is too dense, the airflow will be impeded and dry deposition will decrease. High concentrations of air pollutants increase dry

[5] U.S. EPA Region 9, which includes California, Nevada, and Arizona, has 28 monitoring locations where CO data is collected.

deposition. This being the case, the best location for vegetation is around the source of the pollutants (Janhäll, 2015). Existing sources of pollution within 300 meters of the project area include permitted stationary sources such as generators and gas stations (refer to Appendix C for a map of permitted sources) as well as roadways such as Sir Francis Drake Boulevard.

Construction of the proposed project would involve removal of up to 144 trees from Frederick Allen Park and up to approximately 225 trees in other areas along the creek, depending on the extent of USACE-required vegetation removal from the existing floodwall and any new floodwalls. The proposed enhancements at Frederick Allen Park also include planting of up to 125 trees and planting with bushes and other types of vegetation that would increase vegetated areas due to the reduction in impervious concrete areas. In addition to on-site planting, urban trees would remain in the project vicinity between nearby residences and the project area. The trees proposed for removal are not surrounding and do not serve as a buffer between a source of air pollutants and sensitive receptors.

While urban vegetation and trees are a tool that can be used to decrease localized levels of particulate matter, ultimately dry deposition has been found to decrease coarse particulate levels by only up to one percent in cities (Nowak, Crane, & Stevens, 2006). Due to the large number of variables that correlate to increases or decreases in concentrations of particulate matter due to dry deposition, the smaller number of trees in the project area would not change concentrations of particulate matter to a degree that could affect the health of sensitive receptors. Impacts on sensitive receptors from changes in concentrations of particulate matter associated with changes in vegetation in the project area would be less than significant.

Mitigation: Implement Mitigation Measure 3.2-3.

Mitigation Measure 3.2-3: Engine Controls for Construction Equipment.

All off-road equipment greater than 25 horsepower that operates for more than 20 total hours over the entire duration of construction activities shall have engines that meet the USEPA or CARB Tier 3 off-road and Diesel Particulate Filter level 3 emission standards or more stringent standards for all phases of construction except the Lower College of Marin concrete channel removal.

Significance after Mitigation: As shown in Table 3.2-8, with implementation of Mitigation Measure 3.2-3, the maximum cancer risk and acute hazard index would be mitigated to below the BAAQMD's significance thresholds, reducing the impact on sensitive receptors to less than significant.

	Significance Determination
Impact 3.2-4: The project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Construction

Typical odor sources of concern include wastewater treatment plants, sanitary landfills, transfer stations, composting facilities, petroleum refineries, asphalt batch plants, chemical manufacturing facilities, fiberglass manufacturing facilities, auto body shops, rendering plants, and coffee roasting facilities. Combustion emissions from the use of diesel fuel in construction equipment could generate localized objectionable odors. If sensitive receptors are located in the immediate vicinity of these activities, odors could be perceivable and constitute a nuisance impact. Construction of the project would take approximately seven months to complete and would take place within the construction hours specified by the applicable local ordinance. Construction equipment and paving activities would not be static and on any given day may take place at different parts of the construction site, which would ensure that receptors are not exposed to odors over the entire duration of the construction period. Any objectionable odors generated by project construction activities and perceived by sensitive receptors would occur on a short-term basis or would be intermittent. A substantial number of people would not be subjected to objectionable odors and the construction-related odor impacts would be less than significant. Further, the stringent idling-time limitations on equipment recommended by the BAAQMD have been incorporated into Mitigation Measure 3.2-2, which would further limit diesel odors generated by construction vehicles.

Operation and Maintenance

Operation of the project would be similar to existing conditions. Project operation and maintenance activities would include sediment and debris removal, vegetation management, and annal inspection. These activities would not emit additional odors above what would otherwise occur under existing maintenance of the flood control channel. The new backup generator could emit some odorous exhaust fumes; however, the generator would be tested for only 50 hours per year. Further, the generator is not directly adjacent to sensitive receptors, and odors dissipate with distance from the source. Therefore, implementation of the project would not cause substantial odorous emission or a substantial increase in the severity of existing odors and the impacts would be less than significant.

Mitigation: None required.

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3.3 Biological Resources

3.3.1 Introduction

This section includes an evaluation of the potential for the proposed project to result in adverse impacts on biological resources. The section provides an overview of the natural and physical environment and the regulatory setting for the biological resources within the project area. The section also includes discussion of the potential project impacts on biological resources and appropriate mitigation measures, as necessary.

3.3.2 Scoping Comments

Comments related to biological impacts were received during the public scoping process. These comments and the location where they are addressed in the biological resources analysis are provided in Table 3.3-1.

Table 3.3-1 Biological Resources Scoping Comments

Agency/Entity	Comment	Location in Biological Resources Section that Comment is Addressed
Charles Goodman	The County must address the removal of over 200 mature trees and how it plans to replace the Park Setting, Privacy, and Habitat Coverage in a timely manner.	Section 3.3.6, Impact 3.3-2
State Lands Commission	For land under the Commission's jurisdiction, the Draft EIR should disclose and analyze all potentially significant effects on sensitive species and habitats in and around the Project area, including special-status wildlife, fish, and plants, and if appropriate, identify feasible mitigation measures to reduce those impacts. The District should conduct queries of the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database and U.S. Fish and Wildlife Service's (USFWS) Special Status Species Database to identify any special-status plant or wildlife species that may occur in the Project area. The Draft EIR should also include a discussion of consultation with the CDFW, USFWS, and National Marine Fisheries Service (NMFS) as applicable, including any recommended mitigation measures and potentially required permits identified by these agencies.	Section 3.3.6, Impact 3.3-1
State Lands Commission	Invasive Species: One of the major stressors in California waterways is introduced species. Therefore, the Draft EIR should consider the Project's potential to encourage the establishment or proliferation of aquatic invasive species (AIS) such as the quagga mussel, or other nonindigenous, invasive species including aquatic and terrestrial plants. For example, construction boats and barges brought in from long stays at distant projects may transport new species to the Project area via hull biofouling, wherein marine and aquatic	Section 3.3.6, Impact 3.3-7

Agency/Entity	Comment	Location in Biological Resources Section that Comment is Addressed
	organisms attach to and accumulate on the hull and other submerged parts of a vessel. If the analysis in the Draft EIR finds potentially significant AIS impacts, possible mitigation could include contracting vessels and barges from nearby, or requiring contractors to perform a certain degree of hull-cleaning. The CDFW's Invasive Species Program could assist with this analysis as well as with the development of appropriate mitigation (information at https://www.wildlife.ca.gov/Conservation/Invasives).	
State Lands Commission	Construction Noise: The Draft EIR should also evaluate noise and vibration impacts on fish and birds from construction and restoration activities in the water. Mitigation measures could include species-specific work windows as defined by CDFW, USFWS, and NMFS. Again, staff recommends early consultation with these agencies to minimize the impacts of the Project on sensitive species.	Section 3.3.6, Impact 3.3-1
CDFW	Sufficient information regarding the environmental setting is necessary to understand the Project's, and its alternative's (if applicable), significant impacts on the environment (CEQA Guidelines, §§15125 and 15360). CDFW recommends that the CEQA document prepared for the Project provide baseline habitat assessments for special-status plant, fish, and wildlife species located and potentially located within the Project area and surrounding lands, including all rare, threatened, or endangered species (CEQA Guidelines, §15380). Fully protected, threatened or endangered, candidate, and other special-status species that are known to occur, or have the potential to occur in or near the Project site, include, but are not limited to: Coho salmon south of Punta Gorda (*Oncorhynchus kisutch*), state and federally listed as endangered: – California Ridgway's rail (*Rallus obsoletus obsoletus*), state and federally listed as endangered, and a Fully Protected Species – Salt-marsh harvest mouse (*Reithrodontomys raviventris*), state and federally listed as endangered, and a Fully Protected Species – California black rail (*Laterallus jamaicensis coturniculus*), state listed as threatened and a Fully Protected Species – Central California Coast Distinct Population Segment Steelhead (*Oncorhynchus mykiss irideus*), federally listed as threatened – California red-legged frog (*Rana draytonii*), federally listed as threatened and a California Species of Special Concern (SSC) – Foothill yellow-legged frog (*Rana boylii*), SSC – Western pond turtle (*Emys marmorata*), SSC – Pallid bat (*Antrozous pallidus*), SSC – White-tailed kite (*Elanus leucurus*), Fully Protected Species – Napa false indigo (*Amorpha californica* var. *napensis*), California Rare Plant Rank 1B	Section 3.3.3 Environmental Setting and Appendix D (Database Query Results for Special-Status Wildlife and Fish Species in the Project Vicinity)

Agency/Entity	Comment	Location in Biological Resources Section that Comment is Addressed
CDFW	Habitat descriptions and species profiles should include information from multiple sources, including: aerial imagery, historical and recent survey data, field reconnaissance, scientific literature and reports, and findings from positive occurrence databases such as the California Natural Diversity Database (CNDDB). Based on the data and information from the habitat assessment, the CEQA document can then adequately assess which special-status species are likely to occur in the Project vicinity.	Section 3.3.3 Environmental Setting
CDFW	CDFW recommends that prior to Project implementation, surveys be conducted for special-status species with potential to occur, following recommended survey protocols if available. Survey and monitoring protocols and guidelines are available at: https://www.wildlife.ca.gov/Conservation/Survey-Protocol.	Section 3.3.3 Environmental Setting. Protocol-level surveys were not conducted for this CEQA analysis; habitat associations and ranges of each special-status species were compared with existing habitat conditions in the project area; for some species (e.g., salt marsh harvest mouse and Ridgway's rail), presence was assumed.
CDFW	Botanical surveys for special-status plant species, including those with a California Rare Plant Rank (http://www.cnps.org/cnps/rareplants/inventory/), must be conducted during the blooming period for all sensitive plant species potentially occurring within the Project area and require the identification of reference populations. Please refer to CDFW protocols for surveying and evaluating impacts to rare plants available at: https://www.wildlife.ca.gov/Conservation/Plants.	Section 3.3.3 Environmental Setting and Section 3.3.6, Impact 3.3-1
CDFW	The Project takes place along an urbanized corridor of Corte Madera Creek with residential, business, and community structures developed near the creek. The upstream segments of the Project provide freshwater habitat and a riparian corridor composed mostly of hardwood trees (CDFW 2009). The farthest downstream segment of the Project is tidally influenced and transitions to tidal wetland with fewer riparian trees. Corte Madera Creek is designated critical habitat for the state and federally listed as endangered Coho salmon South of Punta Gorda and the federally listed as threatened Central California Coast Distinct Population Segment Steelhead. Corte Madera Creek is also designated essential fish habitat for various life stages of salmon.	Section 3.3.3 Environmental Setting

Agency/Entity	Comment	Location in Biological Resources Section that Comment is Addressed
	Steelhead are present in the creek and Coho have historically utilized the watershed.	
CDFW	The CEQA Guidelines (§15126.2) necessitate that the draft EIR discuss all direct and indirect impacts (temporary and permanent) that may occur with implementation of the Project. This includes evaluating and describing impacts such as: – Potential for "take" of special-status species – Loss or modification of breeding, nesting, dispersal and foraging habitat, including vegetation removal, alteration of soils and hydrology, and removal of habitat structural features (e.g. snags, roosts, overhanging banks) – 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	Section 3.3.6 Impact Discussion
CDFW	Based on the comprehensive analysis of the direct, indirect, and cumulative impacts of the Project, the CEQA Guidelines (§§ 15021, 15063, 15071, 15126.2, 15126.4 and 15370) direct the lead agency to consider and describe all feasible mitigation measures to avoid potentially significant impacts in the draft EIR, and/or mitigate significant impacts of the Project on the environment. This includes a discussion of take avoidance and minimization measures for special-status species, which are recommended to be developed in early consultation with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service and CDFW. These measures can then be incorporated as enforceable Project conditions to reduce potential impacts to biological resources to less-than-significant levels. Fully protected species such as California Ridgway's rail, California black rail, and salt marsh harvest mouse, may not be taken or possessed at any time (Fish and Game Code § 3511). Therefore, the draft EIR is advised to include measures to ensure complete take avoidance of these fully protected species.	Section 3.3.6 Mitigation Measures
CDFW	Tree replacement ratios provided by CDFW: Oak trees: – 4:1 replacement for trees 5 to 10 inches diameter at breast height (DBH) – 5:1 replacement for trees greater than 10 inches to 15 inches DBH – 15:1 replacement for trees greater than 15 inches DBH, which are considered old-growth oaks. Replacement oaks will come from nursery stock grown from locally sourced acorns, or from acorns gathered locally, preferably from the same watershed in which they are planted.	Section 3.3.6, Impact 3.3-2

Agency/Entity	Comment	Location in Biological Resources Section that Comment is Addressed
CDFW	Other tree species greater than or equal to 6 inches DBH will be mitigated at the following ratios: – 1:1 replacement for non-native trees – 3:1 replacement for native trees	Section 3.3.6, Impact 3.3-2
CDFW	The Project area should be revegetated and restored within the same season as construction following a Restoration Plan accepted in writing by CDFW. CDFW recommends habitat mapping and tree surveys be conducted to refine potential impacts prior to submitting the Restoration Plan. CDFW is available to work with the County to determine an appropriate offsite planting location as well.	Section 3.3.3 Environmental Setting and Section 3.3.6, Impact 3.3-2
CDFW	Both the on-site and potentially off-site Restoration Plan should monitor and maintain, as necessary, all plants for a minimum of ten (10) years to ensure successful revegetation. Planted trees and other vegetation should each have a minimum of 85 percent survival at the end of five years. If revegetation survival and/or cover requirements do not meet established goals, replacement planting, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve these requirements should occur. Replacement plants should be monitored with the same survival and growth requirements for five years after planting.	Section 3.3.6, Impact 3.3-2
CDFW (Gregg Erickson)	Any proposed regrading in the draft EIR should assess impacts, and at a minimum, be designed to maintain existing year-round instream habitat. The analysis should include the geomorphology of the creek upstream of the bypass outlet. CDFW recommends a critical riffle analysis utilizing CDFW's Standard Operating Procedure for Critical Riffle Analysis for Fish Passage in California. This may include addressing fish passage design criteria, sediment transport, design storm elevations, scour potential, and shear stress involved in the bypass structure.	The bypass outlet was part of the original USACE project and is no longer being proposed. The re-grading in Unit 4 and potentially adjacent to FAP is designed to maintain and expand year-round instream habitat.
Town of Ross	• Number of trees and species to be removed and replanted in Frederick Allen Park and within the overall Riparian Corridor. • The impacts related to the lack of shade and habitat during the initial years of growth of younger replacement trees including at completion of construction, at 5 years after, and at 10 years after construction.	Section 3.3.6, Impact 3.3-2
Marin Audubon Society	What are the potential impacts of the steps to fish and birds attempting to feed or rest in the creek? We are concerned that use of the steps would result in the creek waters in the vicinity being reduced in habitat value for wildlife, particularly birds. Usually more wildlife can be viewed from further away, i.e. from the trail on the top	Section 3.3.6, Impact 3.3-1

Agency/Entity	Comment	Location in Biological Resources Section that Comment is Addressed
	of the bank. Many studies have confirmed that wildlife leave when humans come close, and we would expect that would occur here.	
Garril Page	All along the creeks and roads, Ross' trees reduce pollution, store carbon, help control storm water, reduce noise and raise property values. Trees promote biodiversity: plants, birds, insects, small animals and microscopic soil dwellers thrive under the tree canopy. Root systems of mature alders and willows in creek bank toes and along walls create stability. The native oaks and redwoods resist wildfire and provide shade and cool water for creeks. These attributes exist; they must be valued proportionately and weighed against the odds of an improbable return of endangered, extirpated coho, the small number of observed migratory salmon and trout, the ecological disturbances resulting from the FAP proposal's expanded development and habitat loss, increased susceptibility to invasive pests and alterations in the forest plant composition and lessened quality of life for residents.	Section 3.3.6, Impact 3.3-2
Garril Page	Ross public life centers around the Post Office, The Common, Ross School, and the commercial area. If the FAP Riparian Corridor Project creates pools of still water, bats and other insect-eaters become an even more important resource. Residences along Ross' creeks benefit from bats and insect predators. The proposed extent and duration of the FAP Riparian Corridor project will result in disturbance of roosts and habitat, and adversely affect enjoyment of exterior areas throughout Ross. Wildlife displaced by the project may never return to the denuded habitat.	Section 3.3.6, Impact 3.3-1
Garril Page	Excessive tree removal proposed for FAP Riparian Corridor creates ecological disturbances, expanded development, habitat loss, increased susceptibility to invasive pests and alterations in the forest plant composition where planned riparian growth may be more susceptible to wildfire.	Section 3.3.6, Impact 3.3-1

3.3.3 Environmental Setting

Methods

The greater Ross Valley area supports many special-status species. Database searches of CDFW's CNDDB (CDFW, 2020a), CNPS's online Inventory of Rare and Endangered Vascular Plants of California (CNPS, 2020a), USFWS's iPaC tool (USFWS, 2020), and NMFS's California Species List were conducted to generate lists of special-status species, sensitive natural communities, and designated critical habitats documented to occur in the vicinity of the project area. The database queries were based on a search of the USGS 7.5-minute quadrangle in which the project is located (San Rafael) and the surrounding eight quadrangles (Bolinas, San Geronimo, Novato, Petaluma Point, San Quentin, San Francisco North, Hunters Point, and

Point Bonita), collectively referred to as the "project vicinity." The resulting lists of special-status species and sensitive natural communities with potential to occur in the project vicinity are provided in Appendix D, including special-status species without the potential to occur in the study area because suitable habitat is not present or the study area is outside the species range.

In addition to the database queries described above, the following information sources were also reviewed:

- Aerial imagery (e.g., Google Earth)
- Historical and recent field reconnaissance and survey data
- USFWS species profiles, species recovery plans, and five-year species reviews
- Scientific research and/or peer-reviewed journal articles
- Unpublished reports
- Citizen science databases including eBird (2020) and iNaturalist (2020) (research-grade records)

Stillwater Sciences reviewed the database query results and then conducted reconnaissance-level biological surveys for botanical, fisheries, and wildlife resources as well as a field delineation of wetlands and waters of the U.S. within the project area on July 15, 2020. The survey extended from approximately 480 feet upstream of Unit 4 and down to the wetland downstream of Unit 2.

The database query results, information collected during the field reconnaissance and other information sources, and the habitat preferences and distributional range of each special-status species were compared with existing habitat conditions and species distribution in the project area. This comparison allowed for a determination of likelihood of each special-status species identified from the database queries to occur in the project area. This analysis resulted in the following categories of the likelihood for a special-status species to occur in or near the project area:

- *None* (no potential to occur): The project area is outside of the species' known distribution or elevation range and/or the species' required habitat is lacking from the project area.
- *Low* (not expected to occur): The species' known distribution or elevation range overlaps with the project area, and the species' required habitat is of very low quality or quantity in the project area; suitable key habitat or habitat elements may be present but may be of poor quality or isolated from the nearest extant occurrences.
- *Moderate* (may possibly occur): The species' known distribution or elevation range overlaps with the project area, and the species' required habitat occurs in the project area.
- *High* (present): The species has been documented in the project area and/or its required habitat occurs in the project area and is of high quality.

Regional Setting

The project is located in Marin County in the San Francisco Bay Area, a floristic subregion of the California Floristic Province's Central Western California region, which contains a diverse assemblage of plant communities and wildlife habitat types. Marin County is located between the Pacific Ocean and San Francisco Bay in California's Coast Range. Elevations range from sea level up to 2,572 feet at the summit of Mount Tamalpais. Marin County has a mild Mediterranean climate with long dry summers and rainy winters; rainfall averages from 30 to 61 inches per year (Marin County Community Development Agency, 2004). Coastal fog is common, especially in late summer when it provides an important source of moisture for local plants and animals.

Approximately 50 percent of the land area in Marin County is under public management as parks, open space, conservation easements, and watershed lands. Most developed areas are in the eastern part of the county, between the San Francisco Bay and Mount Tamalpais. Natural community types in the county include mixed evergreen forest, oak woodland, pine forest, Douglas fir/redwood forest, grassland, coastal beach dune, northern coastal scrub, chaparral, coastal salt marsh, riparian, and freshwater marsh. These communities support a wide range of plant and animal species, including special-status species (Marin County Community Development Agency , 2007). Vegetation communities in Marin have been altered by agriculture, livestock grazing, timber operations, road building, and urban and suburban development beginning in the nineteenth century. Native perennial grasslands have been mostly replaced by non-native annual grassland, and invasive species now have widespread distribution. Marshlands have been filled and developed and creeks narrowed, culverted, and incised. Urban and suburban development have contributed to considerable fragmentation of the remaining natural areas and limited the available floodplain for creek systems (Marin County Community Development Agency , 2007).

Project Setting

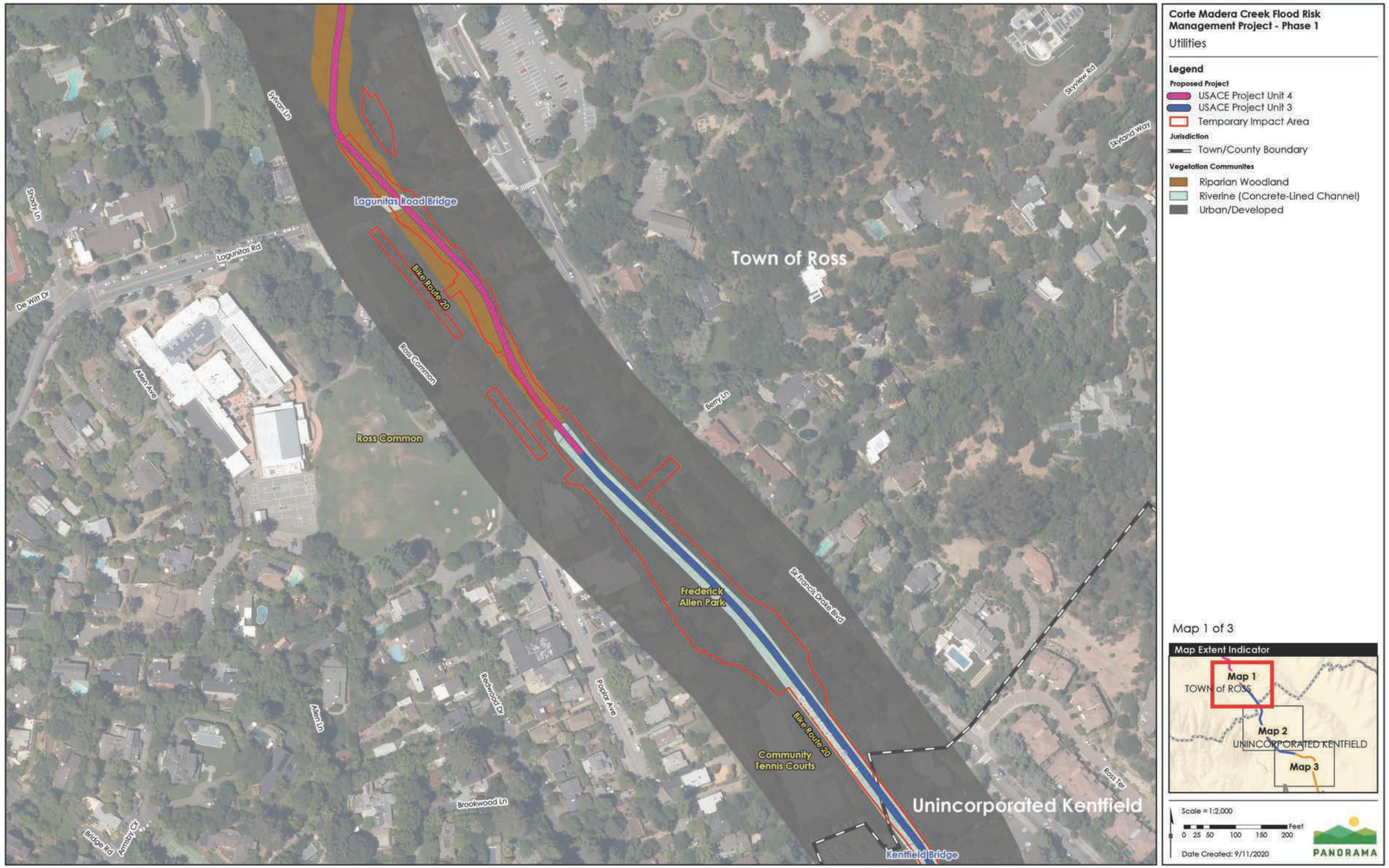
Water flow in Corte Madera Creek is highest in early January and lowest from July through September, when flowing water is uncommon and the stream is predominantly dry (Town of Ross, 2009, in USACE 2010). Water flow during the site visit and delineation was approximately 0.84 cubic feet per second (cfs) as recorded at the U.S. Geological Survey (USGS) Ross gage.

Vegetation Communities and Wetlands

The project area contains three vegetation communities/habitat types: riparian woodland within the natural channel of Unit 4 and, at the downstream end of the project within Unit 2, coastal brackish marsh and acacia woodland (Table 3.3-2; Figure 3.3-1 through Figure 3.3-3) (Atkins North America, Inc., 2011). Unvegetated types found throughout the project area include riverine (both concrete-lined and earthen-lined) as well as urban or developed areas.

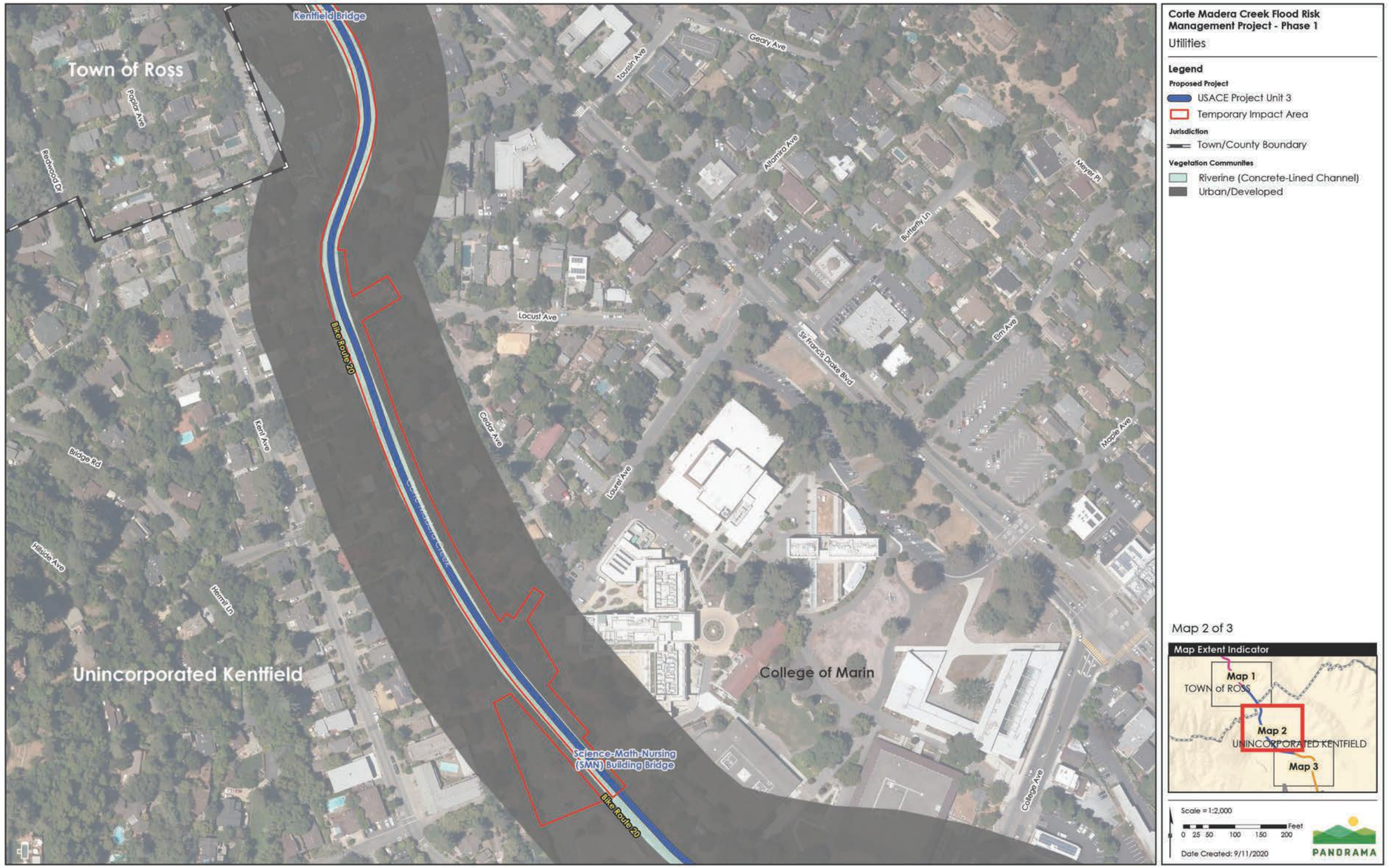
Both nontidal waters and tidal waters were delineated in the project area during a preliminary jurisdictional delineation in July 2020 (Stillwater Sciences, 2020). No wetlands were identified outside of areas delineated as waters (i.e., no wetlands were documented above the ordinary high-water mark or, in tidal areas, above the high-tide line); however, areas mapped as waters included vegetated areas within the channel.

Figure 3.3-1 Habitat Types within Project Area (Map 1 of 3)



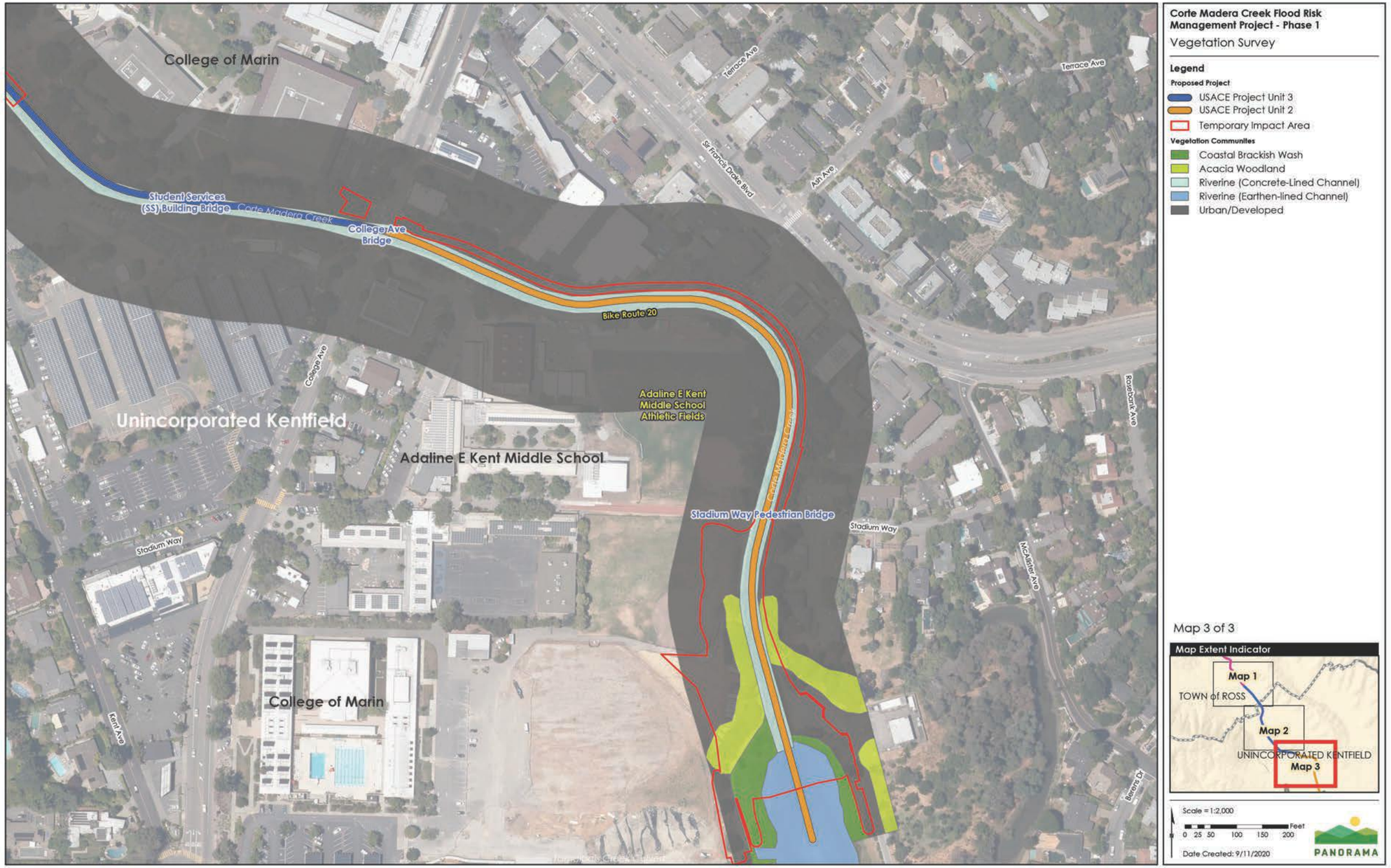
Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2012, GHD 2020, US Geological Survey 2013)

Figure 3.3-2 Habitat Types within Project Area (Map 2 of 3)



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2012, GHD 2020, US Geological Survey 2013)

Figure 3.3-3 Habitat Types within Project Area (Map 3 of 3)



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2012, GHD 2020, US Geological Survey 2013)

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Table 3.3-2 Habitat Types within Project Area (acres)

Habitat Type	Unit 2	Unit 3	Unit 4
Coastal brackish marsh	0.23	--	--
Acacia woodland	0.42	--	--
Riparian woodland	--	--	0.55
Riverine (concrete-lined)	0.37	0.56	--
Riverine (earthen-lined)	0.22	--	0.15
Urban/developed	0.98	1.48	0.44

Coastal Brackish Marsh

Coastal brackish marsh habitat is an intertidal emergent wetland community dominated by grasses, forbs, and shrubs that are tolerant of salinities ranging from slight to moderate (0.5 to 18 ppt [parts per thousand] salt). Coastal brackish marsh habitat occurs in Unit 2 at the downstream end of the project area. Dominant species observed included tuberous bulrushes (*Bolboschoenus* spp.), pickleweed (*Salicornia pacifica*), alkali Russian thistle (*Salsola soda*), and cord grass species (*Spartina* spp.). The coastal brackish marsh may contain sensitive natural communities.

Acacia Woodland

Acacia woodland habitat with some eucalyptus trees occurs in Unit 2 of the project area. Dominant species observed include silver waddle (*Acacia dealbata*) and a few red gum (*Eucalyptus camaldulensis*) trees.

Riparian Woodland

The primary vegetation community in Unit 4 upstream of the existing Denil fish ladder is riparian woodland. This habitat includes the earthen streambed channel of Corte Madera Creek. No riparian woodland habitat exists in the project area downstream of the fish ladder in Units 2 and 3. Canopy cover within the riparian community ranges from 50 to 100 percent throughout Unit 4. Dominant species in the overstory include box elder (*Acer negundo*), silver waddle, big leaf maple (*Acer macrophyllum*), arroyo willow (*Salix lasiolepis*), blue gum (*Eucalyptus globulus*), Oregon ash (*Fraxinus latifolia*), redwood (*Sequoia sempervirens*), and white alder (*Alnus rhombifolia*). Species observed in the understory included Himalayan blackberry (*Rubus armeniacus*), periwinkle (*Vinca major*), English ivy (*Hedera helix*), cape ivy (*Delairea odorata*), French broom (*Genista monspessulana*), dotted smartweed (*Persicaria punctata*), poison oak (*Toxicodendron diversilobum*), and California man-root (*Marah fabaceus*).

Riparian woodland is a structurally complex and productive terrestrial community that forms a closed canopy of mature trees within and adjacent to rivers, creeks, and streams and provides a variety of wildlife species with abundant food, cover, and nesting habitat. Riparian woodland communities are natural vegetation communities that occur in association with streams. Throughout California, over 135 bird species alone depend on riparian habitat for all or a

portion of their lives. Because of the value and scarcity of riparian woodlands, on both a state and region-wide scale, they are considered a sensitive habitat type and monitored by the CDFW. The riparian woodland of Unit 4 is somewhat fragmented by encroaching urbanization, including residential and commercial development, bridges, and landscaping vegetation.

Riverine (concrete-lined channel)
Riverine (concrete-lined channel) habitat in the project area consists of the USACE flood control channel that extends from the fish ladder downstream to Kent Middle School for approximately 4,900 feet. The channel has vertical walls, with a 33-foot-wide concrete streambed with a V-shaped thalweg in the center to concentrate low flows. From Unit 3 to the downstream end of the project, the concrete channels restrict establishment of riparian vegetation. Trees remain along the creek outside of the concrete walls but are often landscaping trees installed as part of urban development. The riverine vegetation in Units 2 and 3 of the project area is sparse, often weedy and non-native, and provides little quality habitat or shade to the creek.

Riverine (earthen-lined channel)
Riverine (earthen-lined channel) habitat includes open-water areas and closely associated vegetation that occur within a defined channel of a stream. Riverine habitat is generally bounded on the landward side by upland vegetation or channel bank. Riverine (earthen-lined channel) habitat within the project area is located in the natural channel of Unit 4 and a small portion of Unit 2 at the downstream end of the project area.

Urban/developed
Urban/developed habitat includes both landscape vegetation (i.e., ornamental plantings) and non-permeable non-vegetated infrastructure such as buildings, roads, trails, and other infrastructure. Landscape vegetation is found in areas of development associated with the Town of Ross Post Office, Town of Ross Police Station, Frederick Allen Park, residential backyards, Kentfield Hospital, and the College of Marin.

Vegetation associated with landscaping consists predominantly of nonnative tree species and includes Chinese pistache (*Pistacia chinensis* subsp. *falcata*), glossy privet (*Ligustrum lucidum*), English elm (*Ulmus minor*), weeping willow (*Salix babylonica*), Monterey pine (*Pinus radiata*), oleander (*Nerium oleander*), honeysuckle (*Lonicera* sp.), cork oak (*Quercus suber*), wisteria (*Wisteria sinensis*), wild plum (*Prunus* sp.), ornamental rose (*Rosa* sp.), and Mexican fan palm (*Washingtonia robusta*). This vegetation is present sporadically along the top of the vertical concrete channel walls and provides limited shade to the creek.

At Frederick Allen Park, areas mapped as landscaped vegetation (Atkins North America, Inc., 2011) includes a mix of native and nonnative landscape trees, of which approximately 69 percent were considered to be in good or excellent condition (i.e., little or no existing disease or damage in canopy or roots), 30 percent were in fair or marginal condition (i.e., minor existing disease or damage in canopy or roots), and 1 percent were either in poor condition (i.e., major existing disease or damage in canopy or root) or presented a hazard to a building and/or structure (GHD 2020). Two-thirds of the trees southeast of the bike path—which includes the

majority of the park set back from the creek—are nonnative tree species and include Norway maple (*Acer platanoides*), southern magnolia (*Magnolia grandiflora*), Chinese pistache, American plum (*Prunus americana*), and English elm. The remaining one-third of the trees southeast of the bike path are native trees and include California buckeye (*Aesculus californica*), coast live oak (*Quercus agrifolia*), and valley oak (*Quercus lobata*). Trees northeast of the bike path and adjacent to the creek are predominantly native trees (i.e., 17 out of 21 trees) and include California buckeye, coast live oak, and valley oak with a few nonnative trees present (Monterey cypress [*Hesperocyparis macrocarpa*] and Monterey pine). Although Frederick Allen Park is mapped as urban/developed, due to its proximity to the creek, CDFW may consider all or a portion of the park to be within the riparian zone.

Fish

In 2000, A.A. Rich and Associates conducted field surveys of the Corte Madera Creek watershed to describe the flows, instream habitat, and fishes of Corte Madera Creek and its tributaries. These surveys collected the following five fish species from the Corte Madera Creek watershed: rainbow trout/Steelhead (*Oncorphynchus mykiss*), threespine stickleback (*Gasterosteus aculeatus*), California roach (*Hesperoleucus symmetricus*), sculpin (*Cottus* sp.), and Sacramento sucker (*Catostomus occidentalis*) (A. A. Rich and Associates, 2000). Stillwater Sciences observed rainbow trout/Steelhead, threespine stickleback, California roach, and Sacramento sucker during their field review on July 15, 2020. The A. A. Rich (2000) report also identified the limiting factors for rainbow Steelhead production in the Corte Madera Creek watershed as being the lack of stream flows and high water temperatures, depending on the creek and the reach location within the creek.

Historically, Corte Madera Creek supported tidewater goby (*Eucyclogobius newberryi*) in the estuary near its mouth, but Leidy (1984) reported that the last time this fish was collected from this locality was in 1958 and believed the tidewater goby was probably extirpated in this area. Corte Madera Creek also historically supported a population of the anadromous salmonid, coho salmon (*Oncorhynchus kisutch*), but the last report of a fisheries survey finding the juveniles of this salmon species in this creek was in 1984 (Leidy & Leidy., 1984; Leidy, Becker, & Harvey., 2005)(Leidy 1984; Leidy 2005). Though not historically present in Corte Madera Creek, another anadromous salmonid, adult Chinook salmon (*Oncorhynchus tshawytscha*), have been reported observed in the creek (Love, 2007). Straying of hatchery-origin chinook salmon to small and medium tributaries to the San Francisco Bay estuary increased greatly once CDFW began trucking salmon smolt downstream of the Sacramento-San Joaquin River Delta and releasing these smolts at Benicia to avoid excessive predation. Chinook salmon do not have a viable self-sustaining population in Corte Madera Creek.

Beginning in late May and extending through September, water temperatures are high (65 to 75 degrees Fahrenheit) in the concrete flood control channel (A. A. Rich and Associates, 2000). Stillwater Sciences recorded a water temperature of 73.4 degrees Fahrenheit on July 15, 2020, at noon. These water temperatures are stressful to any Steelhead or coho salmon in the area during spring and summer months and may be lethal during the smoltification/emigration and rearing life stages of Steelhead. Based on 1999 data, adult Steelhead migrating through the

channel after mid-April could encounter stressful thermal conditions. Similarly, if the parr-to-smolt transformation is not complete by the end of April, there could be thermal stress, beginning in May. For rearing Steelhead, summer water temperatures in the concrete channel are stressful to potentially lethal, beginning in June and extending through September.

Healthy water temperatures for Steelhead range from 54 to 64 degrees Fahrenheit for the spawning, incubation, fry emergence, rearing, and adult life stages (A. A. Rich and Associates, 2000). Upstream of the concrete-lined flood control channel, water temperatures during fry and juvenile rearing begin to approach stressful levels in June. The upstream areas of Corte Madera Creek consist of long lateral scour pools alternating with riffle areas and a riparian canopy, which, along with subsurface flow, help keep the water temperatures cooler. Stillwater Sciences recorded a water temperature of 64.4 degrees Fahrenheit at 10 a.m. on July 15, 2020, in Unit 4.

CDFW (2010) conducted a stream habitat inventory within a 3,336-foot-long reach extending from the Kentfield Hospital Bridge upstream to the mouth of Ross Creek, of which 995 feet located between the fish ladder and bridge was concrete channel. The pool, riffle, and flatwater percentages by length of stream upstream of the concrete channel were 10.5, 5., and 55 percent, respectively. CDFW (2010) also recorded approximately 27 percent of the creek length being dry and 2 percent consisting of the fish ladder. Three pools were measured in the 2,341-foot-long reach upstream of the fish ladder (CDFW, 2010). The average maximum pool depth throughout the survey reach was 3.2 feet.

Flow during the reconnaissance survey on July 15, 2020 was 0.8 cfs, as recorded at the USGS Ross gage (#11460000). The pool, riffle, and flatwater percentages by length of stream along 1,183 feet of natural channel upstream of the fish ladder was 46, 19. and 35 percent, respectively. There were four pools within the Unit 4 survey reach, with maximum depths ranging from 2.3 to 4.3 feet. The substrate was primarily composed of gravel, with sand and cobble being subdominant.

Wildlife

The Corte Madera Creek watershed supports a relatively diverse assemblage of invertebrate, amphibian, reptile, bird, and mammal species. The overall quality of wildlife habitat within the project area is compromised by the concrete-lined channel in the majority of the project area, the proximity to human disturbance, fragmentation of the riparian woodland, density of nonnative vegetation, and lack of available food and escape cover. However, portions of the study area, especially within the natural creek bed segment (Unit 4) and in the coastal brackish marsh at the downstream end of the project area (Unit 2), provide value to wildlife and serve valuable habitat functions by offering wildlife species refuge from urban development.

Wildlife species or sign observed during the July 15, 2020, reconnaissance survey included the following: Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), black-crowned night heron (*Nycticorax nycticorax*), turkey vulture (*Cathartes aura*), red-shouldered hawk (*Buteo lineatus*), killdeer (*Charadrius vociferus*), lesser yellowlegs (*Tringa flavipes*), Anna's hummingbird (*Calypte anna*), Nuttall's woodpecker (*Picoides nuttallii*), Pacific slope flycatcher (*Empidonax*

difficilis), black phoebe (*Sayornis nigricans*), American crow (*Corvus brachyrhynchos*), swallow (sp.) (*Tachycineta* sp.), chestnut-backed chickadee (*Poecile rufescens*), Wilson's warbler (*Cardellina pusilla*), spotted towhee (*Pipilo maculatus*), song sparrow (*Melospiza melodia*), dark-eyed junco (*Junco hyemalis*), hooded oriole (*Icterus cucullatus*), house sparrow (*Passer domesticus*), racoon (scat) (*Procyon lotor*), river otter (scat) (*Lontra canadensis*), and black-tailed deer (scat) (*Odocoileus hemionus*).

Invertebrates

Insects observed in the watershed have included water striders, water scorpions, giant water bugs, water boatmen, water bugs (*Naucoridia* and *Dytiscidae*), diving beetles, whirligigs, Dobson fly larvae, caddis fly larvae, damselfly nymphs, dragonfly nymphs, mayfly nymphs, mosquitoes, gnats, and black flies (USACE, 1987, in Friends of Corte Madera Watershed, 2004). Crayfish are commonly observed in the freshwater reaches of the creek (Friends of Corte Madera Watershed, 2004) and were observed during the field reconnaissance on July 15, 2020.

Amphibians and Reptiles

Riverine habitats with a native streambed and adjacent upland vegetation provide suitable habitat for amphibian and reptiles, particularly within and adjacent to Unit 4 of Corte Madera Creek. Amphibians documented in the greater watershed have included California newt (*Taricha torosa*) and California giant salamander (*Dicamptodon ensatus*). The adjoining woodlands, forests and grasslands also support arboreal salamander (*Aneides lugubris*), California slender salamander, yellow-eyed salamander (*Ensatina eschscholtzii xanthoptica*), and Sierran treefrog (*Pseudacris sierrae*). Reptiles in the project area may include western fence lizard, Pacific gopher snake, ringneck snake (*Diadophis punctatus*), sharp-tailed snake (*Contia tenuis*), and California kingsnake (*Lampropeltis californiae*), among others.

Birds

Friends of Corte Madera Creek Watershed has conducted Christmas Bird Counts from 1978 to 2003. Common bird species observed during these surveys included: black-crowned night heron, snowy egret (*Egretta thula*), great egret (*Ardea alba*), green heron (*Butorides virescens*), great blue heron (*Ardea herodias*), pied-billed grebe (*Podilymbus podiceps*), western grebe (*Aechmophorus occidentalis*), double-crested cormorant (*Phalacrocorax auritus*), turkey vulture (*Cathartes aura*), Canada goose, American wigeon (*Anas americana*), green-winged teal (*Anas crecca*), canvasback (*Aythya valisineria*), greater scaup (*Aythya marila*), lesser scaup (*Aythya affinis*), bufflehead (*Bucephala albeola*), common goldeneye *Bucephala clangula*), hooded merganser (*Lophodytes cucullatus*), ruddy duck (*Oxyura jamaicensis*), osprey (*Pandion haliaetus*), white-tailed kite (*Elanus leucurus*), northern harrier (*Circus cyaneus*), Cooper's hawk (*Accipiter cooperii*), red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk, American kestrel (*Falco sparverius*), American coot (*Fulica americana*), killdeer, black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), greater yellowlegs (*Tringa melanoleuca*), willet (*Catoptrophorus semipalmatus*), least sandpiper (*Calidris minutilla*), ring-billed gull (*Larus delawarensis*), California gull (*Larus californicus*), herring gull (*Larus argentatus*), western gull (*Larus occidentalis*), rock pigeon (*Columbia livia*),band-tailed pigeon (*Columba fasciata*), mourning dove (*Zenaida macroura*), Anna's hummingbird, belted kingfisher (*Ceryle alcyon*), Nuttall's

woodpecker, northern flicker (*Colaptes auratus*), common raven (*Corvus corax*), chestnut-backed chickadee, oak titmouse (*Baeolophus inornatus*), ruby-crowned kinglet (*Regulus calendula*), hermit thrush (*Catharus guttatus*), American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*),cedar waxwing (*Bombycilla cedrorum*), yellow-rumped warbler (*Dendroica coronata*), California towhee (*Pipilo crissalis*), fox sparrow (*Passerella iliaca*), song sparrow, white-crowned sparrow (*Zonotrichia leucophrys*), white-throated sparrow (*Zonotrichia albicollis*), golden-crowned sparrow (*Zonotrichia atricapilla*), dark-eyed junco, red-winged blackbird (*Agelaius phoeniceus*), house finch (*Carpodacus mexicanus*), lesser goldfinch (*Carduelis psaltria*), American goldfinch (*Carduelis tristis*), and house sparrow (Friends of Corte Madera Watershed, 2004).

Mammals

Mammal species using the project area include those adapted to urban environments, including coyote (*Canis latrans*), raccoon, western gray squirrel (*Sciurus griseus*), black-tailed deer, and striped skunk (*Mephitis mephitis*).

Invasive Species

In addition to the native plant, fish, and wildlife species that are found within the project area, many non-native and invasive terrestrial and aquatic species also occur. Invasive plants are defined as noxious by state and federal regulation and classified by the California Invasive Plant Council (Cal-IPC) as high, moderate, limited, alert, or watch, depending on the severity of ecological impacts and rates of dispersal and establishment for each species (Cal-IPC, 2020). Invasive plant species documented within the overstory in the project area include silver wattle (moderate), red gum (limited), blue gum (limited), glossy privet (limited), and Mexican fan palm (moderate/alert). Invasive plant species documented within the understory include cape ivy (high), French broom (high), English ivy (high), Himalayan blackberry (high), Russian thistle (moderate), and periwinkle (moderate). Additional invasive plant species may be found or have the potential to become established within the project area.

The only invasive aquatic species known to occur in Corte Madera Creek is the New Zealand mud snail (*Potamopyrgus antipodarum*). This species was collected from the creek and positively identified during the July 15, 2020, reconnaissance visit.

European starlings and rock pigeons are widespread invasive bird species documented in the project area. Starlings compete with native birds and are known to cause agricultural damage. Rock pigeons are considered pests in urban areas though are not considered as a large threat to native birds.

Special-Status Species and Sensitive Natural Communities

Special-status species are plants and animals that are legally protected under the federal Endangered Species Act (FESA) or the California Endangered Species Act (CESA) or under other regulations or policies such as the California Fish and Game Code and the Migratory Bird Treaty Act (MBTA). California species of special concern and plants identified as rare by the California Native Plant Society (CNPS) are also considered special status and evaluated during

the CEQA environmental review process. The reason an individual taxon (species, subspecies, or variety) is given such recognition is primarily the documented or expected decline in the species' population, limitation of its population size or geographical extent, and/or distribution resulting, in many cases, from habitat loss/fragmentation. More information on these regulations and the agencies that implement their protections is provided in Section 3.3.4, Regulatory Setting.

Special-status species include the following:

- Species listed, proposed, or candidate species for listing as threatened or endangered by the USFWS pursuant to the ESA of 1969, as amended
- Species listed as rare, threatened, or endangered by the CDFW pursuant to the CESA of 1970, as amended
- Species designated as fully protected under the California Fish and Game Code (Sections 3511, 4700, 5050, and 5515)
- Species designated by the CDFW as California species of concern
- Plant species included on CDFW's most recent *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW , 2020b) with a California Rare Plant Rank (CRPR) of 1, 2, 3, or 4
- Plants designated as rare under the California Native Plant Protection Act
- Species not currently protected by statute or regulation but considered rare, threatened, or endangered under CEQA (Section 15380)

Sensitive natural communities were defined as those natural community types with a state ranking of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable) as listed in the most recent *California Sensitive Natural Communities List* (CDFW, 2020c).

The subset of species that have a low, moderate, or high likelihood to occur in the project area are listed in Table 3.3-3. The subset of sensitive natural communities that have a low, moderate, or high likelihood to occur in the project area are listed in Table 3.3-4. Fish and wildlife species with a low to high likelihood to occur in the project area as well as plant or sensitive natural communities that have either a high likelihood to occur or previously documented occurrences that overlap with the project area are discussed in detail below.

Table 3.3-3 Special-Status Species with a Low, Moderate, or High Likelihood to Occur in the Project Area

Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
		Vascular Plants	
Sonoma alopecurus *Alopecurus aequalis var. sonomensis*	FE/none/1B.1	Freshwater marshes and swamps, and riparian scrub; 15 to 1,200 feet	Moderate; suitable habitat present in project area (Unit 2)
Bent-flowered fiddleneck *Amsinckia lunaris*	None/none/CRPR 1B.2	Coastal bluff scrub, cismontane woodland, and valley and foothill grassland; 5 to1,640 feet	Low; limited suitable habitat present in project area (Unit 3 and Unit 4)
Marsh sandwort *Arenaria paludicola*	FE/SE/CRPR 1B.1	Sandy soils and openings in freshwater or brackish marshes and swamps; 5 to 560 feet	Low; limited suitable habitat present in project area (Unit 2)
Coastal marsh milk-vetch *Astragalus pycnostachyus var. pycnostachyus*	None/none/CRPR 1B.2	Coastal dunes (mesic areas), coastal scrub, and streamsides of coastal salt marshes and swamps; 0 to 100 feet	Low; limited suitable habitat present in project area (Unit 2)
Thurber's reed grass *Calamagrostis crassiglumis*	None/none/CRPR 2B.1	Mesic areas in coastal scrub and freshwater marshes and swamps; 30 to 195 feet	Low; limited suitable habitat present in project area (Unit 2)
Seaside bittercress *Cardamine angulata*	None/none/CRPR 2B.2	Wet areas and streambanks in lower coniferous forest, North Coast coniferous forest; 80 to 3,000 feet	Moderate; suitable habitat present in project area (Unit 4)
Bristly sedge *Carex comosa*	None/none/CRPR 2B.1	Coastal prairie, lake margins of marshes and swamps and valley and foothill grassland; 0 to 2,050 feet	Moderate; suitable habitat present in project area (Unit 2)
Lyngbye's sedge *Carex lyngbyei*	None/none/CRPR 2B.2	Brackish or freshwater marshes and swamps; 0 to 35 feet	Moderate; suitable habitat present in project area (Unit 2)
Johnny-nip *Castilleja ambigua var. ambigua*	None/none/CRPR 4.2	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, and vernal pool margins; 0 to 1,425 feet	Moderate; suitable habitat present in project area (Unit 2)
Point Reyes bird's-beak *Chloropyron maritimum subsp. palustre*	None/none/CRPR 1B.2	Coastal salt marshes and swamps; 0 to 35 feet	Moderate; suitable habitat present in project area (Unit 2)

Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
Franciscan thistle *Cirsium andrewsii*	None/none/CRPR 1B.2	Mesic and sometimes serpentine soils in broadleaved upland forest, coastal bluff scrub, coastal prairie, and coastal scrub; 0 to 490 feet	Low; limited suitable habitat present in project area (Unit 4)
California lady's-slipper *Cypripedium californicum*	None/none/CRPR 4.2	Seeps and streambanks, usually serpentine areas of bogs and fens, and lower montane coniferous forest; 95 to 9,020 feet	Moderate; suitable habitat present in project area (Unit 4)
Western leatherwood *Dirca occidentalis*	None/none/CRPR 1B.2	Mesic areas of broadleaved upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland; 80 to 1,395 feet	Moderate; suitable habitat present in project area (Unit 3 and Unit 4)
California bottle-brush grass *Elymus californicus*	None/none/CRPR 4.3	Broadleaved upland forest, cismontane woodland, North Coast coniferous forest, and riparian woodland; 45 to1,540 feet	Moderate; suitable habitat present in project area (Unit 4)
Fragrant fritillary *Fritillaria liliacea*	None/none/CRPR 1B.2	Often serpentine areas in cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland; 5 to 1,345 feet	Low; limited suitable habitat present in project area (Unit 3 and 4)
Large-flowered *leptosiphon Leptosiphon grandiflorus*	None/none/CRPR 4.2	Usually sandy areas of coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, and valley and foothill grassland; 15 to 4,005 feet	Low; limited suitable habitat present in project area (Unit 3 and Unit 4)
Marsh microseris *Microseris paludosa*	None/none/CRPR 1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland; 15 to 1,165 feet	Moderate; suitable habitat present in project area (Unit 3 and Unit 4)
Baker's navarretia *Navarretia leucocephala subsp. bakeri*	None/none/CRPR 1B.1	Mesic areas in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools; 15 to 5,710 feet	Moderate; suitable habitat present in project area (Unit 4)
Gairdner's yampah *Perideridia gairdneri subsp. gairdneri*	None/none/CRPR 4.2	Vernally mesic areas of broadleaved upland forest, chaparral, coastal prairie, vernal pools, and valley and foothill grassland; 0 to 2,000 feet	Moderate; suitable habitat present in project area (Unit 4)

Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
Michael's rein orchid *Piperia michaelii*	None/none/CRPR 4.2	Coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, and lower montane coniferous forest; 5 to 3,000 feet	Moderate; suitable habitat present in project area (Unit 3 and Unit 4)
Hairless popcornflower *Plagiobothrys glaber*	None/none/CRPR 1A	Alkaline meadows and seeps and coastal salt marshes and swamps; 45 to 590 feet	Low; limited suitable habitat present in project area (Unit 2)
North Coast semaphore grass *Pleuropogon hooverianus*	None/ST/CRPR 1B.1	Open areas and mesic soils in broadleaved upland forest, meadows and seeps, and North Coast coniferous forest; 30 to 2,200 feet	Moderate; suitable habitat present in project area (Unit 3 and Unit 4)
Nodding semaphore grass *Pleuropogon refractus*	None/none/CRPR 4.2	Mesic soils in lower montane coniferous forest, meadows and seeps, North Coast coniferous forest, and riparian forest; 0 to 5,250 feet	Moderate; suitable habitat present in project area (Unit 3 and Unit 4)
Marin knotweed *Polygonum marinense*	None/none/CRPR 3.1	Coastal salt or brackish marshes and swamps; 0 to 35 feet	Moderate; suitable habitat present in project area (Unit 2)
Point Reyes checkerbloom *Sidalcea calycosa subsp. rhizomata*	None/none/CRPR 1B.2	Freshwater marshes and swamps near the coast; 5 to 245 feet	Low; limited suitable habitat present in project area (Unit 2)
Santa Cruz microseris *Stebbinsoseris decipiens*	None/none/CRPR 1B.2	Open areas (sometimes serpentinite) in broadleaved upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland; 30 to 1,640 feet	Low; limited suitable habitat present in project area (Unit 3 and Unit 4)
Suisun Marsh aster *Symphyotrichum lentum*	None/none/CRPR 1B.2	Brackish and freshwater marshes and swamps; 0 to 10 feet	Moderate; suitable habitat present in project area (Unit 2)
Saline clover *Trifolium hydrophilum*	None/none/CRPR 1B.2	Marshes and swamps, mesic and alkaline soils in valley and foothill grassland, and vernal pools; 0 to 985 feet	Moderate; suitable habitat present in project area (Unit 2)
		Nonvascular Plants	
Elongate copper moss	None/none/CRPR 4.3	On metamorphic rock (usually acidic, usually vernally mesic, often roadsides, sometimes carbonate) in broadleaved upland forest,	Low; suitable habitat potentially present in

Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
Mielichhoferia elongata		chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, and subalpine coniferous forest; 0 to 6,430 feet	project area (Unit 3 and Unit 4)
		Fish	
Coho salmon, central California coast ESU *Oncorhynchus kisutch*	FE/SE Critical habitat (designated)	Cool, low-gradient streams with deep pools and instream cover; spawns in gravel riffles	Low; presumed extirpated in Corte Madera Creek
Steelhead, central California coast DPS *Oncorhynchus mykiss*	FT/– Critical habitat (designated)	Rivers and streams with cold water, clean gravel of appropriate size for spawning, and suitable rearing habitat; typically rear in fresh water for one or more years before migrating to the ocean	High; known to be present in Corte Madera Creek
Longfin smelt *Spirnichus thaleichthys*	FC/ST	Open waters of estuaries, mostly in the middle or at the bottom of the water column; tolerate salinities ranging from nearly pure salt water to completely fresh water, though most prefer salinities of 15 to 30 ppt; spawning occurs in fresh water during the winter to early spring (February through April) over sandy or gravel substrate	Low; suitable habitat at the downstream end of project area in tidal marsh, but species not recorded in Corte Madera Creek
		Amphibians	
California giant salamander *Dicamptodon ensatus*	–/SSC	Wet coastal forests in or near clear, cold permanent and semi-permanent streams and seepages	Low; marginally suitable habitat in Unit 4; reported observations in Corte Madera Creek watershed (Friends of Corte Madera Watershed, 2004)
California red-legged frog *Rana draytonii*	FT/SSC Critical habitat (designated)	Breeds in still or slow-moving water with emergent and overhanging vegetation, including wetlands, wet meadows, ponds, lakes, and low-gradient, slow-moving stream reaches with permanent pools; uses adjacent uplands for dispersal and summer retreat	Low; suitable non-breeding aquatic habitat, but no hydrological connection to a known population; species presumed absent in eastern Marin County (District, 2017)

Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
Reptiles			
Western pond turtle *Actinemys marmorata*	–/SSC	Permanent, slow-moving fresh or brackish water with available basking sites and adjacent open habitats or forest for nesting	Low; suitable aquatic habitat found in Unit 4, though limited upland nesting habitat
Birds			
White-tailed kite *Elanus leucurus*	–/SFP	Year-round resident; lowland grasslands and wetlands with open areas; nests in trees near open foraging area	Moderate; documented along Corte Madera Creek in project area near Unit 2 (eBird, 2020); nesting and foraging habitat present
American peregrine falcon *Falco peregrinus anatum*		Wetlands, woodlands, cities, agricultural lands, and coastal area with cliffs (and, rarely, broken-top, predominant trees) for nesting; often forages near water	Low; foraging only; documented foraging in Corte Madera Marsh approximately 1.8 miles southeast of project area
California Ridgway's rail *Rallus obsoletus obsoletus*	FE/SE, SFP	Salt and brackish water marshes, typically dominated by pickleweed (Salicornia virginica) and Pacific cordgrass (Spartina foliosa)	Moderate; observed in 2020 approximately 1,800 feet downstream of project area in tidal marsh
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	–/SSC	Brackish marsh, riparian woodland/swamp, freshwater marsh, and salt marsh, often near upland habitats	Moderate; suitable foraging and nesting habitat in the coastal brackish marsh in Unit 2 at the downstream end of the project area
San Pablo song sparrow *Melospiza melodia samuelis*	–/SSC	Tidal salt marshes; requires dense vegetation for nesting; typically associated with California cord grass (Spartina foliosa), pickleweed (Salicornia pacifica), or gumplant (Grindelia stricta)	Moderate; suitable foraging and nesting habitat in the coastal brackish marsh in Unit 2 at the downstream end of the project area
Mammals			
Salt marsh harvest mouse *Reithrodontomys raviventris*	FE/SE, SFP	Tidal salt marshes; depend on dense cover, preferring pickleweed (Salicornia pacifica) and saltgrass	Low; marginally suitable habitat at the downstream end of project area in tidal marsh.
Western red bat *Lasiurus blossevillii*	–/SSC	Riparian forests; woodlands near streams, fields, and orchards	Low (foraging only); limited suitable roosting habitat found in project area

Species	Status (federal/state/other)	General Habitat Requirements	Likelihood within project area
Townsend's western big-eared bat *Corynorhinus townsendii*	–/SSC	Most abundant in mesic habitats; also found in oak woodlands, desert, vegetated drainages, caves or cave-like structures (including basal hollows in large trees, mines, tunnels, and buildings)	Low (foraging only); limited suitable roosting habitat found in project area
Pallid bat *Antrozous pallidus*	–/SSC	Throughout California except for elevations greater than 3,000 meters in the Sierra Nevada; roosts in rock crevices, tree hollows, mines, caves, and a variety of vacant and occupied buildings; feeds in a variety of open woodland habitats	Low (foraging only); limited suitable roosting habitat found in project area

[a] Status codes:

Federal

FE = Listed as endangered under the federal Endangered Species Act (ESA)

FT = Listed as threatened under FESA

FC = Federal candidate species

State

SE = Listed as endangered under the California Endangered Species Act (CESA)

ST = Listed as threatened under CESA

SSC = CDFW species of special concern

SFP = State fully protected

CRPR

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

2B Plants rare, threatened, or endangered in California, but more common elsewhere

3 More information needed about this plant, a review list

4 Plants of limited distribution, a watch list

0.1 Seriously threatened in California (high degree/immediacy of threat)

0.2 Fairly threatened in California (moderate degree/immediacy of threat)

0.3 Not very threatened in California (low degree/immediacy of threats or no current threats known)

Source: (CDFW, 2020a)

Table 3.3-4 Sensitive Natural Communities with a Low, Moderate, or High Likelihood to Occur in the Project Area

Natural community (Holland 1986)	Status (State Rank)	Distribution and Habitat Description	Likelihood within project area
Coastal brackish marsh	S2.1	Usually at the interior edges of coastal bays and estuaries or in coastal lagoons; most extensively developed around Suisun Bay at the mouth of the Sacramento–San Joaquin Delta. Dominated by perennial, emergent, herbaceous monocots to two meters tall; cover is often complete and dense; plant species include plants from both salt marshes and freshwater marshes	High; species and structure are present in project area
Northern coastal salt marsh	S3.2	Occurs along the coast from Pt. Conception north to the Oregon border; extensive in the Bay Area and Humboldt, Marin, Monterey, and San Luis Obispo Counties; found on hydric soils subject to regular tidal inundation in bays, lagoons, and estuaries; dominated by herbaceous, salt-tolerant hydrophytes, forming moderate to relatively complete cover, generally growing throughout the summer and dormant in winter	High; species and structure are present in project area

[a] Statis codes:

S1	Critically imperiled	S3	Vulnerable
S2	Imperiled	0.1	Very threatened
		0.2	Threatened

Source: (CNPS, 2020a)

Special-Status Plants

None of the 29 vascular and non-vascular special-status plant species with potential to occur in the project area were considered to have high potential to occur; no special-status plant species were both documented within the immediate vicinity and had suitable habitat within the project area. Eighteen species have moderate potential to occur within the project area, and ten vascular and one non-vascular special-status plant species were determined to have a low potential to occur within the project area. Three species with previously documented occurrences that overlapped with the project area (Appendix D) are described further in the sections below.

Napa False Indigo

Napa false indigo (*Amorpha californica* var. *napensis*), a CRPR List 1B.2 species, is a shrub in the Fabaceae family and is endemic to California. It occurs in elevations ranging from 390 to 6,560 feet, in openings in broadleaved upland forest, chaparral, and cismontane woodland and blooms from April to July. It is threatened by development and habitat alteration as well as potentially by road maintenance (CNPS, 2020a). Napa false indigo is generally found in Marin, Napa, and Sonoma counties, with a few occurrences in Lake and Monterey counties, as well, and usually found in chaparral habitats. Eighteen of the 76 total documented occurrences of the

species are located within the project vicinity (CDFW, 2020a). Known plant associates include madrone (*Arbutus menziesii*), tan oak (*Notholithocarpus densiflorus*), flat spurred piperia (*Piperia transversa*), Douglas fir (*Pseudotsuga menziesii*), coast live oak, canyon live oak (*Quercus chrysolepis*), California black oak (*Quercus kelloggii*), California nutmeg (*Torreya californica*), and California bay laurel (*Umbellularia californica*).

Although a 1924 documented occurrence of Napa false indigo overlaps with the project area, the location of the occurrence polygon is non-specific (location accuracy of 0.8 mile) (CDFW, 2020a), and the project area is considered to be outside the plant's elevation range. In addition, development over the last 100 years within the valley bottom may have extirpated the occurrence. This being the case, this species is considered not likely to occur in the project area.

Santa Cruz Tarplant

Santa Cruz tarplant (*Holocarpha macradenia*) – a federally threatened, state endangered, and CRPR List 1B.1 species – is an annual in the Asteraceae family and is endemic to California. It occurs in elevations ranging from 30 to 720 feet, often on clay and sandy soils of coastal prairie, coastal scrub, and valley and foothill grassland and blooms from June to October. It is seriously threatened by urbanization, agriculture, non-native plants, and lack of ecological disturbance (CNPS, 2020a). Santa Cruz tarplant was historically found in Alameda, Contra Costa, Monterey, Marin, Santa Cruz, and Solano counties; however, all natural populations have been extirpated, and only re-introduced populations are extant. It usually is found in grassy habitats. Two of the 37 total documented occurrences are located within the project vicinity, only one of which is considered extant (CDFW, 2020a). Known plant associates include wild oat (*Avena fatua*), rattlesnake grass (*Briza maxima*), bromes (*Bromus* spp.), California oat grass (*Danthonia californica*), wall barley (*Hordeum murinum*), and fescues (*Festuca* spp.) (USFWS, 2002).

Although an 1883 documented occurrence of Santa Cruz tarplant indigo overlaps with the project area, the location of the occurrence polygon is non-specific (location accuracy of 1 mile) (CDFW, 2020a). The population is considered extirpated, and suitable habitat is not present in the project area. As such, this species is considered not likely to occur in the project area.

White-Rayed Pentachaeta

White-rayed pentachaeta (*Pentachaeta bellidiflora*) – a federally endangered, state endangered, and CRPR List 1B.1 species – is an annual in the Asteraceae family and is endemic to California. It occurs in elevations ranging from 110 to 2,035 feet in cismontane woodland, and often serpentine areas of valley and foothill grassland, and blooms from March to May. It is threatened by development (CNPS, 2020a). White-rayed pentachaeta is found in Marin, Santa Cruz, and San Mateo counties and usually found in grassy or rocky areas. Six of the 14 total documented occurrences are located within the project vicinity, none of which are considered to be extant (CDFW, 2020a; CDFW, 2020d). Known plant associates include brodiaea species (*Brodiaea* spp.), tidy-tips (*Layia platyglossa*), dotseed plantain (*Plantago erecta*), and purple needle grass (*Stipa pulchra*) (CDFW, 2020a).

Although a 1912 documented occurrence of white-rayed pentachaeta overlaps with the project area, the location of the occurrence polygon is non-specific (location accuracy of 0.4 mile) (CDFW, 2020a). The population is considered extirpated, and the project area is considered to be outside the plant's elevation range. This being the case, this species is considered not likely to occur in the project area.

Sensitive Natural Communities

Four sensitive natural communities were identified in database queries as potentially occurring within the project vicinity (Appendix D). These sensitive natural communities were documented in CNDDB as Holland types (Holland, 1986) that were reviewed and translated to follow the vegetation classification system in the *Manual of California Vegetation* (*MCV*) (CNPS, 2020b). Two sensitive natural communities were determined to have no potential to occur as neither the characteristic plant species nor the habitat structure was present in the project area. Two communities, coastal brackish marsh and northern coastal salt marsh, were determined to have high potential to occur within the downstream end of Unit 2 (Source: (CDFW, 2020a)

Table 3.3-4). In addition, other sensitive natural communities may be present within the riparian habitat found in Unit 4. Although native oak species—predominantly coast live oak—are planted in some locations along the floodwall and within Frederick Allen Park, coast live oak woodland is not considered a sensitive natural community in the most recent *California Sensitive Natural Communities List* (CDFW, 2020c).

Coastal Brackish Marsh

Coastal brackish marsh is generally located on the interior edges of coastal bays and estuaries or in coastal lagoons (Holland, 1986). The most extensive stands are located in Suisun Bay at the mouth of the Sacramento–San Joaquin Delta. This habitat is dominated by perennial, emergent, herbaceous monocots approximately 6 feet tall. Vegetative cover is often dense, and plant associates include plants from both salt and freshwater marshes. Associated sensitive natural communities using *MCV* vegetation alliances include Pacific silverweed marshes, salt marsh bulrush marshes, slough sedge swards, gum plant patches, salt rush swales, water-parsley marsh, ditch-grass mats, and pondweed mats (CNPS, 2020b).

This vegetation community was documented at the downstream end of the project area, in Unit 2. Although the habitat type is not mapped according to *MCV* vegetation alliances, portions of the coastal brackish marsh was dominated by tuberous bulrushes, the characteristic species of the salt marsh bulrush marshes, an S3-ranked sensitive natural community.

Northern Coastal Salt Marsh

Northern coastal salt marsh is generally located on the coast from Point Conception north to the Oregon border, with extensive stands in the San Francisco Bay Area (Holland, 1986). This habitat is found on hydric soils subject to regular tidal inundation in bays, lagoons, and estuaries and is dominated by herbaceous, salt-tolerant hydrophytes. Vegetative cover is often dense. Associated sensitive natural communities using *MCV* vegetation alliances include Pacific silverweed marshes, Parish's glasswort patches, alkali heath marsh, gum plant patches,

pickleweed mats, western sea-purslane marshes, and California cordgrass marsh (CNPS, 2020b).

This vegetation community is potentially intermixed with the mapped coastal brackish marsh at the downstream end of the project area in Unit 2. Species documented within the coastal brackish marsh that are more closely associated with northern coastal salt marsh habitats include pickleweed and cord grass species, the characteristic species of pickleweed mats (S3), and, potentially, California cordgrass marsh (S3.2) if the cordgrass species present is determined to be California cordgrass (*Spartina foliosa*).

Fish

Coho Salmon, Central California Coast Evolutionarily Significant Unit

Coho salmon, although not observed in Corte Madera Creek since 1984, belong to the Central California Coast (CCC) Evolutionarily Significant Unit (ESU) and are state and federally listed as endangered. Corte Madera Creek is designated critical habitat for CCC Coho salmon. Adult Coho salmon typically migrate upstream from mid-November through mid-January then spawn into February or early March. As typical of Pacific salmon, Coho die after this single spawning episode. After rearing in the freshwater creek for usually one year, the juvenile Coho salmon out-migrate during spring high flows in April and May. They then spend 16 to 18 months at sea before returning as adults to spawn in their natal creek (Moyle, 2002). Juvenile Coho salmon prefer deeper pools (>3 feet) with overhead cover and habitat created by large woody debris in the stream channel. The juveniles do best in summer waters of 54 to 57 degrees Fahrenheit and do not persist in waters of 72 to 77 degrees Fahrenheit (Moyle, 2002).

Steelhead, Central California Coast Distinct Population Segment

Steelhead in Corte Madera Creek belong to the Central California Coast (CCC) Distinct Population Segment (DPS) and are federally listed as threatened. Corte Madera Creek is designated critical habitat for CCC Steelhead. Adult winter Steelhead enter the creeks and rivers on their spawning migrations between November and April. The timing of upstream migration for winter Steelhead is correlated with higher flow events, such as freshets or sand bar breaches, and associated lower water temperatures. Steelhead spend anywhere from one to five years in saltwater; a period of two to three years is most common (Busby, et al., 1996). Steelhead spawn in mainstems, tributaries, and intermittent streams (Everest, 1973; Barnhart, 1986)). Reiser and Bjornn (1979) found that Steelhead prefer spawning gravels ranging in size from 0.5 to 4.6 inches. The number of days required for Steelhead eggs to hatch is inversely proportional to water temperature and varies from about 19 days at 60.1 degrees Fahrenheit to about 80 days at 42.1 degrees Fahrenheit. Fry typically emerge from the gravel two to three weeks after hatching (Barnhart, 1986). Upon emerging from the gravel, fry rear in edgewater habitats and move gradually into pools and riffles as they grow larger. Older fry establish territories, which they defend. Young Steelhead feed on a variety of aquatic and terrestrial insects, and emerging fry are sometimes preyed upon by older juveniles. Rearing Steelhead juveniles prefer water temperatures of 45.0 to 58.0 degrees Fahrenheit and have an upper lethal limit of 75.0 degrees Fahrenheit. Steelhead that are successful in surviving to adulthood spend at least two years in fresh water before emigrating downstream. Steelhead are known to inhabit

Corte Madera Creek; however, population monitoring data are not available. In 1999, A.A. Rich conducted electrofishing in Corte Madera Creek and captured rainbow/Steelhead trout at a density of 0.03 to 0.14 fish/square meter of instream habitat (A. A. Rich and Associates, 2000).

Tidewater Goby

Tidewater goby is federally listed as an endangered species and a state species of special concern. It is distributed from San Diego County north to the mouth of the Smith River in Del Norte County. This species inhabits coastal lagoons and the uppermost zone of brackish large estuaries with muted tidal flow and prefers sandy substrate for spawning but can be found on silt, mud, or rocky substrates. Tidewater gobies can occur in water up to 15 feet in lagoons and within a wide range of salinity (0 to 42 ppt). This species was last observed in 1961 over a mile downstream of the project area and is likely extirpated from this locality (CDFW, 2020a). The project area does not contain the muted tidal flow estuarine conditions this species requires. Therefore, tidewater gobies will not be discussed in the impact assessment.

Longfin Smelt

The longfin smelt is a candidate for listing under federal ESA and is listed as threatened under CESA. Spawning occurs in fresh water during the winter to early spring (February through April) over sandy or gravel substrate. Most smelt die after spawning, but a few (mostly females) may live another year. The eggs are adhesive and hatch in 40 days, when water temperatures are 44 degrees Fahrenheit. Newly hatched larvae are 0.2 to 0.3 inches long. Larvae can be moved downstream to estuaries by high flows but may also spend considerable time in fresh water. Very few larvae (individuals smaller than 0.8 inches in length) are found in salinities greater than eight ppt. It takes almost three months for longfin smelt to reach the juvenile stage (USFWS, 2012). Rosenfield and Baxter (2007) reported that longfin smelt catch per unit effort was greater at channel sites (>23 feet deep) than at shoal sites (<23 feet deep) in the San Francisco Bay estuary in each age group, and the difference was significant from the first fall through the second spring of life and between the second fall and winter of life. This indicates that longfin smelt may preferentially select deep water rather than shallow water habitats. Sampling by the City of San Francisco during several years in the early 1980s detected longfin smelt in the Pacific Ocean, providing additional evidence that some part of this population migrates beyond the Golden Gate Bridge (City of San Francisco & CH2M HILL, 1985, in Rosenfield and Baxter, 2007). Longfin Smelt concentration in deep water habitats combined with migration into marine environments during summer months suggests that Longfin Smelt may be relatively intolerant of warm waters (Rosenfield & Baxter, 2007). The same may be true for Corte Madera Creek, especially given its shallow nature and summertime warming. Longfin smelt have been captured in the bay east of Corte Madera Creek, but no evidence establishes presence in the project area. Therefore, longfin smelt is not discussed further in the impact assessment.

Wildlife

California Giant Salamander

California giant salamander is endemic to California and a CDFW species of special concern. This species occurs in two, possibly three isolated regions from Mendocino County south to

Sonoma and Marin Counties, then continuing south of the San Francisco Bay from San Mateo to southern Santa Cruz County (Nafis, 2018). This species occurs in wet, humid coastal forests, particularly in Douglas fir, redwood, red fir, and montane and valley-foothill riparian habitats with cold permanent and semi-permanent rocky streams and seepages. Larvae and aquatic adults use aquatic stream habitats, and terrestrial adults use cover objects such as logs, leaf litter, rocks, or subterranean tunnels (Nussbaum, Brodie, & Storm, 1983). Adults actively migrate on rainy nights (Zeiner, Laudenslayer, Mayer, & White, 1988-1990).

There is a low likelihood for California giant salamander to occur in the project area. There are reported observations of California giant salamander in upper Corte Madera Creek watershed (Friends of Corte Madera Watershed, 2004; iNaturalist, 2020). While there is suitable aquatic habitat in Unit 4, this unit flows directly into the concrete-lined channel, which is unsuitable habitat. Furthermore, the adjacent upland habitat for terrestrial adults is very limited in extent and quality because of the narrow band of forest cover and proximity to housing and other human development. California giant salamanders will not be affected by project implementation and therefore will not be discussed further.

California Red-Legged Frog

California red-legged frog is federally listed as threatened and is a CDFW species of special concern. The species' range occurs from south of Elk Creek in Mendocino County to Baja California, with isolated remnant populations occurring in the Sierra foothills, from sea level to approximately 8,000 feet (Stebbins, 2003; Shaffer, Fellers, Voss, Oliver, & Pauly, 2004). Most California red-legged frog populations are currently largely restricted to coastal drainages on the central coast of California. California red-legged frog habitat generally includes wetlands, wet meadows, ponds, lakes, and low-gradient, slow-moving stream reaches. Breeding occurs in November through March, and habitats are generally characterized by still or slow-moving water with deep pools (usually at least 2.3 feet, though frogs have occasionally been known to breed in pools less than this depth) and emergent and overhanging vegetation (Jennings & Hayes, 1994). Breeding sites can be ephemeral or permanent; if ephemeral, inundation is usually necessary into the summer months (through July to August) for successful metamorphosis. Although some adults may remain resident year-round at favorable breeding sites, others may disperse overland up to a mile (1.6 kilometers) or more (Fellers & Kleeman, 2007). Movements may be along riparian corridors, but many individuals move directly from one site to another without apparent regard for topography or watershed corridors (Bulger, Scott, & Seymour, 2003). California red-legged frogs sometimes enter a dormant state during summer or in dry weather (aestivation), finding cover in small mammal burrows, moist leaf litter, root wads, or cracks in the soil.

California red-legged frogs are likely absent from the project area. While the project area is within the species' historical range, California red-legged frogs have not been detected in the Corte Madera Creek Watershed, and there are no known records within the species' dispersal range. The nearest CNDDB occurrence is approximately 4 miles northeast of the project area, at Point San Pedro; there is an extensive network of development, roads, and human activity that would preclude dispersal from this area. There is suitable non-breeding aquatic habitat in

Unit 4; the concrete channel in downstream Units 2 and 3 provides very little habitat value. High winter flows and the presence of predatory fish further reduce any habitat suitability for breeding. California red-legged frogs will not be affected by project implementation and therefore will not be discussed further.

Western Pond Turtle

Western pond turtle is a CDFW species of special concern. In California, this species is found from the Oregon border along the Pacific Coast Ranges to the Mexican border as well as west of the crest of the Cascades and Sierras. Western pond turtles inhabit fresh or brackish water characterized by areas of deep water, low flow velocities, moderate amounts of riparian vegetation, warm water and/or ample basking sites, and underwater cover elements, such as large woody debris and rocks (Jennings & Hayes, 1994). Along major rivers, western pond turtles are often concentrated within side channel and backwater areas. Turtles may move to off-channel habitats, such as oxbows, during periods of high flows (Holland D. C., 1994). Although adults are habitat generalists, hatchlings and juveniles require specialized habitat for survival through their first few years. Hatchlings spend much of their time feeding in shallow water with dense submerged or short emergent vegetation (Jennings & Hayes, 1994). Although an aquatic reptile, western pond turtles require upland habitats for basking, overwintering, and nesting, typically within 1 kilometer (0.6 mile) from aquatic habitats (Holland D. C., 1994).

Western pond turtle has a low likelihood of occurrence in the project area. There is suitable aquatic habitat in Unit 4, and the concrete channel downstream in Units 2 and 3 provides little habitat value. While there is some suitable aquatic habitat in Unit 4, there are few suitable deep pools and/or off-channel habitats and limited opportunities for basking sites as the reach is very shady. Western pond turtles require open uplands adjacent to water for nesting; the adjacent uplands are limited in extent and quality, providing marginal nesting opportunities because of the narrow band of forest cover and proximity to housing and other human development. The closest documented western pond turtle occurrence is at Phoenix Lake, a dammed impoundment of Ross Creek, which is located approximately 1.5 miles upstream from Lagunitas Road Bridge.

White-Tailed Kite

White-tailed kite is a CDFW fully protected species. White-tailed kite is a resident (breeding and wintering) species throughout central and coastal California, up to the western edge of the foothills of the Sierra Nevada; California constitutes the stronghold of its North American breeding range (Zeiner, Laudenslayer, Mayer, & White, 1988-1990; Dunk, 1995). They are not migratory but may make slight seasonal range shifts in coastal areas during winter (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). White-tailed kites breed in lowland grasslands, oak woodlands or savannah, and wetlands with open areas. Riparian corridors represent a preferred landscape characteristic for kites in both the breeding and non-breeding seasons (Erichsen, 1995). Groves of trees are required for perching and nesting, though kites do not seem to associate with particular tree species (Dunk, 1995). Preferred foraging sites include open and ungrazed grasslands, agricultural fields, wetlands, and meadows that support large populations of small mammals. The white-tailed kite's year-round diet consists almost entirely

of small mammals (Dunk, 1995; Erichsen, 1995) but can also include birds, insects, and reptiles. White-tailed kites breed between February and October, with peak breeding in May through August (Zeiner, Laudenslayer, Mayer, & White, 1988-1990).

White-tailed kites have moderate potential to occur in the project area based on observations along Corte Madera Creek just downstream of the project area (eBird, 2020) and presence of suitable nesting and foraging habitat. The eBird (2020) sightings just downstream of the project area along Corte Madera Creek include two white-tailed kites "often seen in the area" and "carrying food," both signs of a likely breeding pair. The riparian corridor in the project area includes numerous tall trees with structure suitable for nesting and perching. Open spaces along Unit 2 (e.g., near College of Marin) provide foraging opportunities.

American Peregrine Falcon

The American peregrine falcon is a CDFW fully protected species. This species breeds in coastal California north of Santa Barbara, southern portions of the Sierra Nevada, and other mountains in northern California (Zeiner, Laudenslayer, Mayer, & White, 1988-1990; White, Clum, Cade, & Hunt, 2002). This species uses a variety of open habitats including wetlands, woodlands, cities, agricultural lands, and coastal areas (Gertsch, DeWater, & Walton, 1994); riparian habitat and wetlands are particularly important (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). American peregrine falcons typically nest in open settings with unobstructed views and open access, often near water (e.g., wetlands, rivers, coastal areas). Nests are usually made in a depression or scrape on a high cliff ledge but are also found in dunes, on human-made structures, and occasionally within abandoned raptor nests in large, predominant snags or trees (Zeiner, Laudenslayer, Mayer, & White, 1988-1990; White, Clum, Cade, & Hunt, 2002). Birds in urban environments have been observed nesting on city buildings and bridges (White, Clum, Cade, & Hunt, 2002). American peregrine falcons hunt prey in a variety of open habitat types such as wetlands, estuaries, mudflats, marshes, meadows, lakes, and rivers (Porter, White, & Erwin, 1973). Generally monogamous throughout the year, American peregrine falcon pairs roost and hunt cooperatively (White, Clum, Cade, & Hunt, 2002). This species feeds mainly on birds and occasionally bats or other small mammals, fish, or insects (Zeiner, Laudenslayer, Mayer, & White, 1988-1990; White, Clum, Cade, & Hunt, 2002).

There is suitable foraging habitat for American peregrine falcon in the coastal brackish marsh in Unit 2 at the downstream end of the project area. This species has been documented foraging in Corte Madera Marsh approximately 1.8 miles southeast of the project area (eBird, 2020). There are no cliffs or predominant trees in the project area where peregrine falcons would be expected to nest though they have been known to nest in man-made structures including water towers or tall buildings. As foraging habitat will not be affected by any project element, American peregrine falcon is not discussed further.

California Ridgway's Rail

California Ridgway's rail (formerly California clapper rail) is federally listed as endangered. Ridgway's rails reside and breed entirely within the marshes of the greater San Francisco Bay estuary, including the Central/South Bay, San Pablo Bay, and Suisun Marsh areas. Critical

habitat has not been designated for this species. Ridgway's rails inhabit tidal salt marshes and brackish marshes, often dominated by pickleweed (*Sarcocornia pacifica*), gumplant (*Grindelia*), and/or cordgrass (*Spartina* spp.). Other plant associates include saltgrass (*Distichlis spicata*), bulrushes (*Scirpus* spp.), and cattails (*Typha* sp.). This species nests in the upper-middle tidal marsh plain or high tidal marsh zones. Nests must be high enough to be protected from tidal inundation for successful reproduction. To allow for concealment, vegetation surrounding the nest site is usually tall (50 centimeters high or greater near mean high water) (USFWS, 2010). Nest sites are composed of a platform and woven canopy of vegetation. Foraging and refuge areas include the adjacent transitional zone as well as the lower, middle, and high marsh zones.

There is a photo-verified 2019 Ridgway's rail sighting in Corte Madera Creek approximately 600 feet downstream of the project area on the right bank near a set of culverts (eBird, 2020). There are numerous other sightings from 2011, 2014, 2015, 2017, 2019, and 2020 in Hal Brown Park at Creekside, including calling, approximately 1,500 feet downstream of the project area. An adult Ridgway's rail with young has also been seen in the relict mouth of Tamalpais Creek near College of Marin Parking Lot 13, approximately 1,000 feet downstream of Unit 2 (S. Guldman, pers. comm. with D. Halligan, Stillwater, October 8, 2020). There is suitable cover habitat for this species immediately downstream of Unit 2 though it is not likely extensive enough to support nesting as the tidal zone as this location is very narrow. Recent Ridgway's rail surveys for the San Francisco Estuary Invasive Spartina Project report the College of Marin sub-area of Corte Madera Creek as having "insufficient habitat" (Oolofson Environmental, 2020).

Saltmarsh Common Yellowthroat

Saltmarsh common yellowthroat (also known as San Francisco common yellowthroat) (*Geothlypis trichas sinuosa*), a distinct subspecies of the common yellowthroat (*Geothlypis trichas*), is a CDFW species of special concern. It is a year-round resident in the San Francisco Bay Area. Typical habitats for San Francisco common yellowthroat include brackish marsh, riparian woodland/swamp, freshwater marsh, salt marsh, and upland freshwater marsh (Gardali & Evens, 2008). They are typically associated with peppergrass (*Lepidium latifolium*), cordgrass, and bulrush/tule (*Schoenoplectus* spp.) (Nur, Zack, Evens, & Gardali, 1997). The Point Reyes Bird Observatory found that during surveys, sites with more pickleweed tended to have fewer yellowthroats (Nur, Zack, Evens, & Gardali, 1997). Nests are usually placed over water in emergent aquatic vegetation, dense shrubs, or other dense vegetation.

There is suitable foraging and nesting habitat for saltmarsh common yellowthroat in the coastal brackish marsh in Unit 2 at the downstream end of the project area, and there are multiple sightings of common yellowthroat (*Geothlypis trichas*) in more extensive marsh habitat just downstream of Unit 2 (eBird, 2020).

San Pablo Song Sparrow

San Pablo song sparrow (also known as Samuel's song sparrow) (*Melospiza melodia samuelis*), a distinct subspecies of the song sparrow (*Melospiza melodia*), is a CDFW species of special concern. This California endemic subspecies' distribution is restricted to tidal and muted tidal

salt marshes along the San Pablo Bay, with the highest densities reported at the Petaluma River mouth (Spautz & Nur, 2008). Samuel's song sparrows are primarily associated with high marsh and pickleweed where there is tidal influence. Dense vegetation is required for nesting, song perches, and cover from predators (Marshall, 1948, in Spautz & Nur, 2008).

There is suitable foraging and nesting habitat for San Pablo song sparrow in the coastal brackish marsh in Unit 2 at the downstream end of the project area, and there are multiple sightings of song sparrow (*Melospiza melodia*) in more extensive marsh habitat just downstream of Unit 2 (eBird, 2020).

Salt Marsh Harvest Mouse

Salt marsh harvest mouse is federally and state-listed as endangered and is a CDFW fully protected species. Populations are currently found only in small portions of San Francisco, San Pablo, and Suisun bays and their tributaries (USFWS, 2010). Optimal habitat includes saline emergent wetlands vegetated by deep and dense stands of pickleweed. Though salt marsh harvest mice are strong swimmers, they require non-submerged, salt-tolerant plants (such as gumplant) to escape high tides (USFWS, 2010). Salt marsh harvest mouse can tolerate high salinity food and water. Suitable habitat includes salt marshes with dense pickleweed (*Salicornia virginica*) adjacent to upland vegetation for escape from higher tides. The diet of salt marsh harvest mouse includes both green vegetation and seeds, but pickleweed is a major food source. The mice are seldomly found in cordgrass, alkali bulrush, or pure stands of salt grass (Shellhammer, et al., 1982, in LSA, 2012). Salt marsh harvest mouse may also occasionally move into adjoining upland grassland areas (USFWS, 2010). The life span of salt marsh harvest mouse is only eight to twelve months, requiring constant population renewal. Females are sexually active from March to November but may only bear one litter per year (USFWS, 1984). Young salt marsh harvest mice can disperse a considerable distance, but fragmented habitats preclude wide dispersal. Salt marsh harvest mice will not cross open areas to disperse.

There is a very low possibility that salt marsh harvest mouse would occur in the downstream end of the project area beyond the concrete channel where the intertidal wetland is present. This species was last observed downstream of the project in 1959. This species is now presumed extirpated from the vicinity of the project area (CDFW, 2020a). There were sightings of salt marsh harvest mouse from the Corte Madera Ecological Reserve, approximately 2 miles east/southeast of the project area, in 1990 (CDFW, 2020a). Numerous observations have been made in the salt marshes east of Highway 101. Despite its very low potential to occur because of marginally suitable habitat, the salt marsh harvest mouse is federally, and state listed as endangered and fully protected by CDFW; therefore, its presence will be assumed in the wetland portion of Unit 2 for the purposes of the impact assessment and mitigation measure development.

Western Red Bat

Western red bat is a CDFW species of special concern. In California, the western red bat has been observed near the Pacific Coast and in the Central Valley and the Sierra Nevada range and foothills. Roosts have often been observed in edge habitats—near streams, fields, orchards, or

urban areas (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). This species roosts non-colonially, in dense canopies and within tree foliage, beneath overhanging leaves (Constantine, 1959; Shump & Shump, 1982), at 2 to 40 feet above ground level (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). Studies in the Central Valley found that summering populations are substantially more abundant in remnant riparian stands of cottonwood or sycamore greater than 164 feet wide than in younger, less-extensive stands (Pierson, Rainey, & Corben, 2000). Individuals may forage up to 0.3 to 0.6 mile from their day roosts (Zeiner, Laudenslayer, Mayer, & White, 1988-1990), both at canopy height and low over the ground (Shump & Shump, 1982). This species feeds primarily on small moths, but its diet may include a variety of other insects, such as crickets, beetles, and cicadas (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). Mating occurs in August and September. Breeding sites are associated with the same type and amount of cover as roost sites, within cottonwood/sycamore riparian habitats along large river drainages in the Central Valley (Zeiner, Laudenslayer, Mayer, & White, 1988-1990; Pierson & Rainey, 2003). Fertilization is delayed until March or April. After an 80- to 90-day gestation period, pups are born from late May through early July.

There is foraging habitat for western red bat in the project area along Corte Madera Creek and possible opportunities for roosting in tree foliage in the riparian woodland associated with Unit 4. There are no recorded occurrences within 5 miles of the project area (CDFW, 2020a); however, few bat surveys have been conducted in this region. Western red bat is not expected to roost in trees associated with Unit 4 or Frederick Allen Park as this species is primarily associated with Fremont cottonwoods and sycamores. Because there will be no impacts to roosting habitat, and effects on foraging habitat would be beneficial by the creation of pools that may attract insects, these bat species are not discussed further.

Townsend's Big-Eared Bat

Townsend's big-eared bat is a CDFW species of special concern. They have been documented from sea level to 10,800 feet although, in California, maternity roosts appear to be confined to elevations below 5,900 feet (Pierson & Fellers, 1998; Sherwin & Piaggio, 2005). This species occurs throughout California and is associated with caves and structures in a variety of habitats from deserts to coastal scrub to montane forests. This cavity-dwelling species roosts and hibernates in caves (commonly limestone or basaltic lava), mines, buildings, bridges (with a cave-like understructure), rock crevices, tunnels, basal hollows in large trees, and cave-like attics (Pierson & Fellers, 1998; Pierson & Rainey, 2007). Foraging has been observed in a variety of habitats (e.g., oak woodlands, desert scrub, alfalfa fields, vegetated creek drainages and in forested areas).

There is foraging habitat for Townsend's big-eared bat in the project area along Corte Madera Creek; however, there are limited opportunities for roosting. The project area does not provide substantial cavity habitat (e.g., for maternity or overwinter roosts) such as caves or mines; however, this species may use old buildings or bridges as day roosts. Because there will be no impacts to roosting habitat, and any effects on foraging habitat would be beneficial by the creation of pools that may attract insects, these bat species are not discussed further.

Pallid Bat

Pallid bat, a CDFW species of special concern, is fairly widespread in California. Pallid bats occupy a variety of habitats, from arid deserts to grasslands to conifer forests and riparian areas. Roosts (including day, night, and maternity roosts) are typically located in rock crevices and cliffs; day roosts can also be found in tree hollows and caves (Hermanson & O'Shea, 1983; Lewis, 1994; Pierson, Rainey, & Miller, 1996; Pierson, Rainey, & Corben, 2001). In more urban settings, roosts are frequently associated with human structures, such as abandoned buildings, abandoned mines, and bridges (Pierson, Rainey, & Miller, 1996; Pierson, Rainey, & Corben, 2001). Overwintering roosts require relatively cool and stable temperatures out of direct sunlight. Pallid bats typically glean prey from the ground and may forage 1 to 3 miles from their day roosts (Zeiner, Laudenslayer, Mayer, & White, 1988-1990). The pallid bat is a colonial species, with a typical maternal colony size of 50 to 300 individuals (Hermanson & O'Shea, 1983; Lewis, 1994; Pierson, Rainey, & Miller, 1996). Breeding occurs from late October to February. With an average litter size of two, the young are born between April and July and are typically weaned in August (Sherwin & Rambaldini, 2005).

There is foraging habitat for pallid bat in the project area along Corte Madera Creek; however, there are limited opportunities for roosting. The project area does not provide substantial cavity habitat (e.g., for maternity or overwinter roosts) such as caves or mines; however, this species may use old buildings or bridges as day roosts. Because there will be no impacts to roosting habitat, and any effects on foraging habitat would be beneficial by the creation of pools that may attract insects, these bat species are not discussed further.

Habitat Connectivity and Wildlife Movement

Fish Passage

Fish passage and instream habitat in the Corte Madera watershed are described below in context of the needs of the anadromous Steelhead, which still ascend the creek as adults, spawn, and rear juveniles in the headwater tributaries. These same habitat and passage requirements approximate the needs of coho salmon that once utilized Corte Madera Creek. Rearing habitat requirement for the juvenile Steelhead are similar to that required for resident rainbow trout in the stream.

Adult Steelhead migrate from the ocean into coastal freshwater streams and rivers for spawning during high-flow events occurring from December through March (Love, 2007). Coho salmon, currently extirpated from Corte Madera Creek, typically make their spawning migration up small coastal streams like Corte Madera Creek with the rains of mid-November to mid-December (Moyle, 2002). Most of the project area along Corte Madera Creek functions as a migration route that links the saltwater habitat of San Francisco Bay with headwater Steelhead spawning and juvenile rearing locations. The quality of the creek as a migration corridor is degraded by the concrete channelization found in Units 2 and 3. The bulkhead and poorly functioning fish ladder at the boundary between Units 3 and 4 further impairs upstream movement. A survey of the watershed identified 48 stream crossings within areas accessible to Steelhead (Taylor, Ross and Associates, 2006). Some of these stream crossings were complete

barriers to upstream movement (e.g., Phoenix Lake Dam), some were considered partial barriers (e.g., the Denil fish ladder), and others, such as the Lagunitas Road crossing, were not considered an obstruction (Taylor, Ross and Associates, 2006). Overall, Corte Madera Creek's anadromous fish migration corridor downstream of the Lagunitas Road Bridge has been modified and degraded by past human action but is still capable of supporting movement of fish under certain flow conditions (Love, 2007). Once migrating Steelhead pass the fish ladder, Unit 4 provides suitable access to upstream reaches that are utilized for spawning and rearing.

The concrete channel below the existing fish ladder acts as a velocity barrier for migrating adult salmonids during high-flow times because of limited low-velocity areas. The concrete channel may also act as a thermal barrier to smolts as they swim downstream to the ocean (Town of Ross, 2009, in USACE 2010). As a result, the concrete flood control channel has severely reduced access to the creek for spawning runs of these species (Friends of Corte Madera Creek, 2008). Steelhead have often been observed attempting to pass through the existing fish ladder. The fish ladder was constructed as a temporary solution to provide fish passage over the bulkhead until the Unit 4 project could be constructed. Although repairs to this ladder in 2005 reportedly improved its performance, the ladder still fails to provide suitable passage at higher flows that are more common during the period of migration (Love, 2007).

Rearing juvenile Steelhead also conduct local movements related to foraging for food, defending territories, or seeking improved water quality. These movements would typically occur in Unit 4 due to the presence of suitable habitat in that reach. Rearing juvenile Steelhead may also temporarily inhabit the existing fish-migration pools within the concrete channel but would attempt to move upstream as water quality conditions deteriorate during the summer months. These concrete channel rearing fish would have their upstream movements inhibited by the fish ladder.

Wildlife Travel

Wildlife movement activities usually fall into one of three movement categories: (1) dispersal (i.e., juvenile animals from natal areas or individuals extending range distributions); (2) seasonal migration; and (3) local movements related to home-range activities (i.e., foraging for food or water, defending territories, or searching for mates, breeding areas, or cover). Although a variety of terms have been used to discuss wildlife movement across the landscape, this discussion focuses on travel routes. Travel routes are determined by features on the landscape that provide food, water, and shelter while also connecting areas of suitable habitat.

Riparian and aquatic habitats can provide food, water, and cover for wildlife, and the habitats can be important travel routes. In the case of terrestrial species, most truly migratory species that use the riparian corridor in the project area are migratory birds. Larger animals, such as deer and coyote, are unlikely to make seasonal or life-cycle-driven movements through the project area beyond occasional dispersal movements of young animals as the floodwalls present substantial barriers to movement.

The reconnaissance survey and review of aerial photos of the project area indicate that urban development has encroached into the riparian habitat. Modifications of the riparian area include construction of houses and related structures, riparian vegetation removal and landscaping, and channel stabilization work. Channelization, alteration, and encroachment into what were riparian areas in Units 2 and 3 have removed most of the riparian habitat. The result is that areas downstream of Unit 4 would not provide a substantial terrestrial wildlife movement corridor. However, evidence was observed that otters and racoons use the concrete channel for foraging. Even though urbanization and other actions have also degraded the riparian area in Unit 4, a more natural channel form and riparian vegetation remain. Unit 4 does not serve as a connection between natural habitats and, therefore, may not be considered as a functioning migration corridor. However, it does provide habitat for localized wildlife movement within the riparian corridor and dispersal opportunities for wildlife that may be within the surrounding urban landscape. As a result, Unit 4 has greater value than the downstream units with respect to local wildlife movement and likely supports species adapted to survival in urbanized settings.

Habitat Conservation Plans and Natural Community Conservation Plans

There are no federal habitat conservation plans or State Natural Community Conservation Plans within Marin County. Therefore, this issue will not be discussed further in this EIR.

Critical Habitat

Corte Madera Creek contains designated critical habitat for CCC coho salmon and CCC steelhead.

The five essential habitat types for CCC coho salmon include (1) juvenile summer and winter rearing areas, (2) juvenile migration corridors, (3) areas for growth and development to adulthood, (4) adult migration corridors, and (5) spawning areas. Corte Madera Creek contains areas 1, 2, 4, and 5. Growth and development to adulthood (area 3) occurs primarily in near- and off-shore marine waters; however, final maturation takes place in freshwater tributaries when the adults return to spawn.

The physical or biological features (PBF) of critical habitat that are essential for the conservation of CCC Steelhead are the following: (1) freshwater spawning sites, (2) freshwater migration corridors, (3) estuarine areas, (4) near-shore marine areas, and (5) offshore marine areas. The CCC steelhead PBF within the project area include items 1 through 3.

The project area does not contain any designated critical habitat for plants or wildlife.

3.3.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project and are defined as standard conditions for the project.

Federal Regulations

Federal Endangered Species Act

FESA protects listed fish and wildlife species from harm or "take," which is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Take can also include habitat modification or degradation that directly results in death or injury to a listed wildlife species. An activity can be defined as take even if it is unintentional or accidental. Listed plant species are legally protected from take under FESA if they occur on federal lands or if a project requires a federal action, such as a Clean Water Act Section 404 fill permit.

The USFWS has jurisdiction over federally listed threatened and endangered species, and the National Marine Fisheries Service (NMFS, also called NOAA Fisheries) has jurisdiction over federally listed, threatened, and endangered marine and anadromous fish such as salmon and steelhead. These two agencies also maintain lists of species proposed for listing. Species on these lists are not legally protected under the FESA but may become listed in the near future; these agencies often include them in their review of a project. Designated critical habitats for FESA-listed species are also regulated and protected by these agencies.

Clean Water Act/Waters of the United States

Areas meeting the regulatory definition of "Waters of the United States" (Waters of the U.S.) (jurisdictional waters) are subject to the jurisdiction of the USACE under provisions of Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. These waters may include all waters used, or potentially used, for interstate commerce, including all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (such as intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, natural ponds), all impoundments of waters otherwise defined as Waters of the U.S., tributaries of waters otherwise defined as Waters of the U.S., the territorial seas, and wetlands (termed Special Aquatic Sites) adjacent to Waters of the U.S. (33 Code of Federal Regulations [CFR] Section 328.3).

Impacts to jurisdictional Waters of the U.S. are regulated under Section 404 of the Clean Water Act, for which the USACE and the U.S. Environmental Protection Agency (USEPA) have enforcement responsibility. The water-quality-related aspects of the Clean Water Act have been delegated to the California Water Resources Control Board and the Regional Water Quality Control Boards (RWQCBs); those regulations are discussed below.

Federal Migratory Bird Treaty Act

The federal MBTA (16 United States Code [U.S.C.] § 703) prohibits the pursuit, hunting, take, capture, or killing of migratory birds in the United States, including nests and eggs of migratory birds during the breeding season. The current U.S. Department of the Interior interpretation of the MBTA (memorandum M-37050 in December 2017) does not prohibit or penalize take of

migratory birds that results from incidental take during operations. Taking of nests from construction activity remains prohibited under MBTA.

Magnuson-Stevens Fishery Conservation and Management Act
The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act or MSA) is the primary law governing marine fisheries management in U.S. federal waters. One objective of the act is to conserve Essential Fish Habitat. A consultation with NMFS is required whenever a federal agency permits, funds, or implements a project that could affect essential fish habitat. Corte Madera Creek and its upstream tributaries, including San Anselmo Creek and Fairfax Creek, are designated as Essential Fish Habitat for several species of salmonids. Thus, consultation with NMFS, concurrent with its FESA consultation, is likely to be required.

State and Regional Regulations and Agencies

California Endangered Species Act and Other Special-Status Species Regulations
CESA prohibits the take of any plant or animal listed or proposed for listing as rare (plants only), threatened, or endangered. The CESA definition of take differs from the FESA definition. Under CESA, take is defined as hunting, pursuing, catching, capturing, or killing or attempting to do any of those things. There is also no state-level equivalent of critical habitat for listed species.

In accordance with the CESA, the CDFW has jurisdiction over state-listed species (Fish and Game Code §2070). CDFW also maintains lists of species of special concern that are defined as species that appear to be vulnerable to extinction because of declining populations, limited ranges, and/or continuing threats. CDFW also regulates fully protected animals, a classification which was the state's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Most, but not all, fully protected animals also have been listed as threatened or endangered species under the more recent state and federal endangered species laws and regulations. CDFW can authorize take of listed species, except fully protected animals, under CESA Sections 2080.1 and 2081 and 2089.2-2098.26, which allow CDFW to issue Consistency Determinations, Incidental Take Permits (ITPs), and Safe Harbor Agreements, respectively.

Fish and Game Code Sections 1602
CDFW implements Section 1602 of Fish and Game Code through the Lake and Streambed Alteration Agreement process, under which it regulates changes in non-tidal aquatic habitats and the riparian corridors that often surround them. The Fish and Game Code section 1602 requires an entity to notify CDFW prior to commencing any activity that may (1) substantially divert or obstruct the natural flow of any river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or (3) deposit debris, waste, or other materials that could pass into any river, stream, or lake (CDFW, 2018). A Lake and Streambed Alteration Agreement (LSAA) covers activities that would result in the modification of the bed, bank, or channel of a stream, river, or lake, including water diversion and damming and removal of vegetation from the floodplain to the landward extent of the riparian zone. It governs both activities that modify the physical characteristics of the stream

and activities that may affect fish and wildlife resources that use the stream and surrounding habitat (i.e., the riparian vegetation or wetlands). A Section 1602 LSAA will often require mitigation, such as revegetation or replanting of riparian trees or other compensatory mitigation, for impacts to these resources.

Fish and Game Code Sections 3503 and 3513

Under California Fish and Game Code Section 3503, it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided. Fish and Game Code Section 3503.5 protects all birds of prey (raptors) and their eggs and nests, and under Section 3513, it is unlawful to take or possess any migratory non-game bird designated under the MBTA. Conservation measures incorporated into the project will assure compliance with these Fish and Game Code sections.

Clean Water Act Section 401/San Francisco Bay Regional Water Quality Control Board

The San Francisco Bay RWQCB has primary authority for implementing Section 401 of the federal Clean Water Act and California's Porter-Cologne Water Quality Control Act, which pertains to waters of the State of California. These statutes regulate water quality conditions by establishing processes for developing and implementing planning, permitting, and enforcement authority for waste discharges to land and water. The San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan) establishes beneficial uses for surface and groundwater resources and sets regulatory water quality objectives that are designed to protect those beneficial uses (RWQCB, 2011).

Under the current Basin Plan, designated beneficial uses for Corte Madera Creek include commercial and sport fishing, navigation, and contact and noncontact recreation; warm freshwater fish habitat; cold freshwater fish habitat; wildlife habitat; preservation of rare and endangered species; migration of aquatic organisms; and spawning, reproduction, and/or early development of fish. The Basin Plan provides a program of actions designed to preserve and enhance water quality and to protect beneficial uses. It meets the requirements of the USEPA and establishes conditions related to discharges that must be met at all times. The implementation portion of the Basin Plan includes descriptions of specific actions to be taken by local public entities and industries to comply with the Basin Plan's policies and objectives. These actions include measures for urban runoff management and wetland protection.

Native Plant Protection Act

The Native Plant Protection Act (NPPA; CFG Code Section 1900 et seq.) designates 64 species, subspecies, and varieties of native California plants as rare. NPPA prohibits take of rare native plants but includes some exceptions for agricultural and nursery operations, emergencies, and

after proper notification of CDFW for vegetation removal from canals, roads, and other sites, changes in land use, and in certain other situations.

Oak Woodland Protection

Public Resources Code Section 21083.4

This section defines requirements under CEQA for evaluating project impacts on oak woodlands. Each county is required to determine whether a project in its jurisdiction may result in a conversion of oak woodlands that will have a significant effect on the environment. If a county determines that there may be a significant effect to oak woodlands, the county shall require one or more of the following oak woodlands mitigation alternatives to mitigate the significant effect of the conversion of oak woodlands:

> (1) Conserve oak woodlands through the use of conservation easements.
>
> (2)(A) Plant an appropriate number of trees, including maintaining plantings and replacing dead or diseased trees.
>
> (B) The requirement to maintain trees pursuant to this paragraph terminates seven years after the trees are planted.
>
> (C) Mitigation pursuant to this paragraph shall not fulfill more than one-half of the mitigation requirement for the project.
>
> (D) The requirements imposed pursuant to this paragraph also may be used to restore former oak woodlands.
>
> (3) Contribute funds to the Oak Woodlands Conservation Fund, as established under subdivision (a) of Section 1363 of the Fish and Game Code, for the purpose of purchasing oak woodlands conservation easements, as specified under paragraph (1) of subdivision (d) of that section and the guidelines and criteria of the Wildlife Conservation Board. A project applicant that contributes funds under this paragraph shall not receive a grant from the Oak Woodlands Conservation Fund as part of the mitigation for the project.
>
> (4) Other mitigation measures developed by the county.

California Rare Plant Ranks

Special-status plants in California are assigned to one of five CRPR by a group of over 300 botanists in government, academia, non-governmental organizations, and the private sector. This effort is jointly managed by the CDFW and CNPS. The five CRPRs currently recognized by the CNDDB include the following:

- Rare Plant Rank 1A – presumed extinct in California
- Rare Plant Rank 1B – rare, threatened, or endangered in California and elsewhere
- Rare Plant Rank 2 – rare, threatened, or endangered in California but more common elsewhere
- Rare Plant Rank 3 – a review list of plants about which more information is needed

- Rare Plant Rank 4 – a watch list of plants of limited distribution

Substantial impacts to plants ranked 1A, 1B, and 2 are typically considered significant based on Section 15380 of the CEQA Guidelines, depending on the policy of the lead agency. Plants ranked 3 and 4 may be evaluated by the lead agency on a case-by-case basis to determine significance thresholds under CEQA.

Local Regulations

Marin County Municipal Code

The following codes in the Marin County Municipal Code are relevant to the project (Marin County, 2020).

Chapter 22.27 Native Tree Protection and Preservation

Section 22.27.030 Prohibition on Removal of Protected Trees. Protected Trees shall not be removed except in compliance with Section 22.62.040 (Exemptions), and as provided for in Chapter 22.62 (Tree Removal Permits). (Ord. No. 3577, 2012)

Chapter 22.62 Tree Removal Permits

Section 22.62.040 Exemptions. The removal of any protected or heritage tree on a lot is exempt from the requirements of this Chapter if it meets at least one of the following criteria for removal:

A. The general health of the tree is so poor due to disease, damage, or age that efforts to ensure its long-term health and survival are unlikely to be successful;
B. The tree is infected by a pathogen or attacked by insects that threaten surrounding trees as determined by an arborist report or other qualified professional;
C. The tree is a potential public health and safety hazard due to the risk of its falling and its structural instability cannot be remedied;
D. The tree is a public nuisance by causing damage to improvements, such as building foundations, retaining walls, roadways/driveways, patios, sidewalks and decks, or interfering with the operation, repair, or maintenance of public utilities;
E. The tree has been identified by a Fire Inspector as a fire hazard;
F. The tree was planted for a commercial tree enterprise, such as Christmas tree farms or orchards;
G. Prohibiting the removal of the tree will conflict with CC&R's which existed at the time this Chapter was adopted;
H. The tree is located on land which is zoned for agriculture (A, ARP, APZ, C-ARP or C-APZ) and that is being used for commercial agricultural purposes. (This criterion is provided to recognize the agricultural property owner's need to manage these large properties and continue their efforts to be good stewards of the land.);

I. The tree removal is by a public agency to provide for the routine management and maintenance of public land or to construct a fuel break;
J. The tree removal is on a developed lot and: 1) does not exceed two protected trees within a one-year timeframe; 2) does not entail the removal of any heritage trees; and 3) does not entail the removal of any protected or heritage trees within a Stream Conservation Area or a Wetland Conservation Area.

It is recommended that a property owner obtain a report from a licensed arborist or verify the status of the tree with photographs to document the applicability of the criteria listed above to a tree which is considered for removal in compliance with this section. (Ord. No. 3577, 2012)

Chapter 22.130 Definition

22.130.030 Definitions of Specialized Terms and Phrases

Protected Tree and Heritage Tree. Any one of the following as indicated in the table below:

Common Name	Botanical Name	Protected Size Diameter at Breast Height	Heritage Size Diameter at Breast Height
Arroyo willow	*S. lasiolepis*	6 inches	18 inches
Big-leaf maple	*Acer macrophyllum*	10 inches	30 inches
Bishop pine	*Pinus muricata*	10 inches	30 inches
Blue oak	*Q. douglasii*	6 inches	18 inches
Box elder	*A. negundo var. californicum*	10 inches	30 inches
California bay	*Umbellularia californica*	10 inches	30 inches
California black oak	*Q. kelloggii*	6 inches	18 inches
California buckeye	*Aesculus californica*	10 inches	30 inches
California nutmeg	*Torreya california*	10 inches	30 inches
Canyon live oak	*Q. chrysolepis*	6 inches	18 inches
Chaparral oak	*Q. wislizeni*	6 inches	18 inches
Coast live oak	*Quercus agrifolia*	6 inches	18 inches
Coast redwood	*Sequoia sempervirens*	10 inches	30 inches

Common Name	Botanical Name	Protected Size Diameter at Breast Height	Heritage Size Diameter at Breast Height
Douglas-fir	*Pseudotsuga menziesii*	10 inches	30 inches
Giant Chinquapin	*Castanopsis chrysophylla*	10 inches	30 inches
Hawthorn	*Crataegus douglasii*	10 inches	30 inches
Mountain-mahogany	*Cercocarpus betuloides*	10 inches	30 inches
Narrow leaved willow	*Salix exigua*	6 inches	18 inches
Oak	*Q. parvula var. shrevei*	6 inches	18 inches
Oregon ash	*Fraxinus latifolia*	10 inches	30 inches
Oregon oak	*Q. garryana*	6 inches	18 inches
Pacific madrone	*Arbutus menziesii*	6 inches	18 inches
Pacific yew	*Taxus brevifolia*	10 inches	30 inches
Red alder	*A. rubra*	10 inches	30 inches
Red elderberry	*Sambucus callicarpa*	10 inches	30 inches
Red willow	*S. laevigata*	6 inches	18 inches
Sargent cypress	*Cupressus sargentii*	6 inches	18 inches
Scoulier's willow	*S. scouleriana*	6 inches	18 inches
Service-berry	*Amelanchier alnifolia*	10 inches	30 inches
Shining willow	*S. lucida ssp. lasiandra*	6 inches	18 inches
Silk tassel	*Garrya elliptica*	10 inches	30 inches
Sitka willow	*S sitchensis*	6 inches	18 inches
Tanbark oak	*Lithocarpus densiflorus*	10 inches	30 inches
Valley oak	*Q. lobata*	6 inches	18 inches

Common Name	Botanical Name	Protected Size Diameter at Breast Height	Heritage Size Diameter at Breast Height
Wax myrtle	*Myrica californica*	10 inches	30 inches
White alder	*Alnus rhombifolia*	10 inches	30 inches

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan are relevant to the project.

Biological Resources

Goal BIO-1: Enhanced Native Habitat and Biodiversity. Effectively manage and enhance native habitat, maintain viable native plant and animal populations, and provide for improved biodiversity throughout the County.

> ***Policy BIO-1.1: Protect Wetlands, Habitat for Special-Status Species, Sensitive Natural Communities, and Important Wildlife Nursery Areas and Movement Corridors***. Protect sensitive biological resources, wetlands, migratory species of the Pacific flyway, and wildlife movement corridors through careful environmental review of proposed development applications, including consideration of cumulative impacts, participation in comprehensive habitat management programs with other local agencies and resource management agencies, and continued acquisition and management of open space lands that provide for permanent protection of important natural habitats.
>
> ***Policy BIO-1.3: Protect Woodlands, Forests, and Tree Resources***. Protect large native trees, trees with historical importance; oak woodlands; healthy and safe eucalyptus groves that support colonies of monarch butterflies, colonial nesting birds, or known raptor sites; and forest habitats. Prevent the untimely removal of trees through implementation of standards in the Development Code and the Native Tree Preservation and Protection Ordinance. Encourage other local agencies to adopt tree preservation ordinances to protect native trees and woodlands, regardless of whether they are located in urban or undeveloped areas.
>
> ***Policy BIO-1.6: Control Spread of Invasive Exotic Plants***. Prohibit use of invasive species in required landscaping as part of the discretionary review of proposed development. Work with landowners, landscapers, the Marin County Open Space District, nurseries, and the multi-agency Weed Management Area to remove and prevent the spread of highly invasive and noxious weeds. Invasive plants are those plants listed in the State's Noxious Weed List, the California Invasive Plant Council's list of Exotic Pest Plants of Greatest Ecological Concern in California, and other priority species identified by the agricultural commissioner and California Department of Agriculture.

Goal BIO-2: Protection of Sensitive Biological Resources. Require identification of sensitive biological resources and commitment to adequate protection and mitigation, and monitor development trends and resource preservation efforts.

Policy BIO-2.1: Include Resource Preservation in Environmental Review. Require environmental review pursuant to CEQA of development applications to assess the impact of proposed development on native species and habitat diversity, particularly special-status species, sensitive natural communities, wetlands, and important wildlife nursery areas and movement corridors. Require adequate mitigation measures for ensuring the protection of any sensitive resources and achieving "no net loss" of sensitive habitat acreage, values, and function.

Policy BIO-2.3: Preserve Ecotones. Condition or modify development permits to ensure that ecotones, or natural transitions between habitat types, are preserved and enhanced because of their importance to wildlife. Ecotones of particular concern include those along the margins of riparian corridors, baylands and marshlands, vernal pools, and woodlands and forests where they transition to grasslands and other habitat types.

Policy BIO-2.4: Protect Wildlife Nursery Areas and Movement Corridors. Ensure that important corridors for wildlife movement and dispersal are protected as a condition of discretionary permits, including consideration of cumulative impacts. Features of particular importance to wildlife for movement may include riparian corridors, shorelines of the coast and bay, and ridgelines. Linkages and corridors shall be provided that connect sensitive habitat areas such as woodlands, forests, wetlands, and essential habitat for special-status species, including an assessment of cumulative impacts.

Policy BIO-2.5: Restrict Disturbance in Sensitive Habitat During Nesting Season. Limit construction and other sources of potential disturbance in sensitive riparian corridors, wetlands, and baylands to protect bird nesting activities. Disturbance should generally be set back from sensitive habitat during the nesting season from March 1 through August 1 to protect bird nesting, rearing, and fledging activities. Preconstruction surveys should be conducted by a qualified professional when development is proposed in sensitive habitat areas during the nesting season, and appropriate restrictions should be defined to protect nests in active use and ensure that any young have fledged before construction proceeds.

Policy BIO-2.8: Coordinate with Trustee Agencies. Consult with trustee agencies (the CDFW, USFWS, NOAA Fisheries, USACE, USEPA, RWCQB, and BCDC) during environmental review when special-status species, sensitive natural communities, or wetlands may be adversely affected. Goal BIO-3: Wetland Conservation. Require all feasible measures to avoid and minimize potential adverse impacts on existing wetlands and to encourage programs for restoration and enhancement of degraded wetlands.

Policy BIO-3.1: Protect Wetlands. Require development to avoid wetland areas so that the existing wetlands and upland buffers are preserved and opportunities for

enhancement are retained (areas within setbacks may contain significant resource values similar to those within wetlands and also provide a transitional protection zone).

Goal BIO-4: Riparian Conservation. Protect and, where possible, restore the natural structure and function of riparian systems.

Policy BIO-4.4: Promote Natural Stream Channel Function. Retain and, where possible, restore the hydraulic capacity and natural functions of stream channels in SCAs. Discourage alteration of the bed or banks of the stream, including filling, grading, excavating, and installation of storm drains and culverts. When feasible, replace impervious surfaces with pervious surfaces. Protect and enhance fish habitat, including through retention of large woody debris, except where removal is essential to protect against property damage or prevent safety hazards. In no case shall alterations that create barriers to fish migration be allowed on streams mapped as historically supporting salmonids. Alteration of natural channels within SCAs for flood control should be designed and constructed in a manner that retains and protects the riparian vegetation, allows sufficient capacity and natural channel migration, and allows reestablishment of woody trees and shrubs without compromising the flood flow capacity where avoidance of existing riparian vegetation is not possible. (Details in setbacks and other aspects of stream corridors are in Section 2.4 of the Marin Countywide Plan.)

Policy BIO-4.5: Restore and Stabilize Stream Channels. Pursue stream restoration and appropriate channel redesign where sufficient right-of-way exists that includes the following: a hydraulic design, a channel plan form, a composite channel cross-section that incorporates low flow and bankfull channels, removal and control of invasive exotic plant species, and biotechnical bank stabilization methods to promote quick establishment of riparian trees and other native vegetation.

Policy BIO-4.6: Control Exotic Vegetation. Remove and replace invasive exotic plants with native plants as part of stream restoration projects and as a condition of site-specific development approval in a SCA, and include monitoring to prevent reestablishment.

Policy BIO-4.7: Protect Riparian Vegetation. Retain riparian vegetation for: stabilization of streambanks and floodplains, moderating water temperatures, trapping and filtering sediments and other water pollutants, providing wildlife habitat, and aesthetic reasons.

Policy BIO-4.8: Reclaim Damaged Portions of SCAs. Restore damaged portions of SCAs to their natural state wherever possible, and reestablish as quickly as possible any herbaceous and woody vegetation that must be removed within an SCA, replicating the structure and species composition of indigenous native riparian vegetation.

Policy BIO-4.9: Restore Culverted Streams. Replace storm drains and culverts in SCAs with natural drainage and flood control channels wherever feasible. Reopening and

restoring culverted reaches of natural drainages should be considered part of review of development applications on parcels containing historic natural drainages where sufficient land area is available to accommodate both the reopened drainage and project objectives. Detailed hydrologic analysis may be required to address possible erosion and flooding implications of reopening the culverted reach, and to make appropriate design recommendations. Incentives should be provided to landowners in restoring culverted, channelized, or degraded stream segments. Where culverts interfere with fish migration but replacement is not possible, modify culverts to allow unobstructed fish passage.

Policy BIO-4.15: Reduce Wet Weather Impacts. Ensure that development work adjacent to and potentially affecting SCAs is not done during the wet weather or when water is flowing through streams, except for emergency repairs, and that disturbed soils are stabilized and replanted, and areas where woody vegetation has been removed are replanted with suitable species before the beginning of the rainy season.

Policy BIO-4.16: Regulate Channel and Flow Alteration. Allow alteration of stream channels or reduction in flow volumes only after completion of environmental review, commitment to appropriate mitigation measures, and issuance of appropriate permits by jurisdictional agencies based on determination of adequate flows necessary to protect fish habitats, water quality, riparian vegetation, natural dynamics of stream functions, groundwater recharge areas, and downstream users.

Policy BIO-4.19: Maintain Channel Stability. Applicants for development projects may be required to prepare a hydraulic and/or geomorphic assessment of onsite and downstream drainage ways that are affected by project area runoff. This assessment should be required where evidence that significant current or impending channel instability is present, such as documented channel bed incision, lateral erosion of banks (e.g., sloughing or landsliding), tree collapse due to streambank undermining and/or soil loss, or severe in-channel sedimentation, as determined by the County. (More details are available in Section 2.4 of the Marin Countywide Plan.)

Policy BIO-4.20: Minimize Runoff. In order to decrease stormwater runoff, the feasibility of developing a peak stormwater management program shall be evaluated to provide mitigation opportunities such as removal of impervious surface or increased stormwater detention in the watershed.

Water Resources

Goal WR-1: Healthy Watersheds. Achieve and maintain proper ecological functioning of watersheds, including sediment transport, groundwater recharge and filtration, biological processes, and natural flood mitigation, while ensuring high-quality water.

Policy WR-1.2: Restore and Enhance Watersheds. Support watershed restoration efforts, coordinate County watershed activities with efforts by other groups, and simplify permit acquisition for watershed restoration and enhancement projects.

Goal WR-2: Clean Water. Ensure that surface and groundwater supplies are sufficiently unpolluted to support local natural communities, the health of the human population, and the viability of agriculture and other commercial uses.

> ***Policy WR-2.3: Avoid Erosion and Sedimentation***. Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and onsite sediment retention. Require developments to include onsite facilities for the retention of sediments and, if necessary, require continued monitoring and maintenance of these facilities upon project completion.

Town of Ross Municipal Code

The following code in the Town of Ross Municipal Code is applicable to the project (Town of Ross, 2020).

Chapter 12.24 Planting, Alteration, Removal, or Maintenance of Trees

12.24.020 Definitions.

(5) "Native tree," means a tree native to those lands that now constitute the town of Ross.

(8) "Protected trees," means any tree located within twenty-five feet (25') of the front or side yard property line or within forty feet (40') of the rear yard property line of any parcel, with such tree having a diameter greater than eight inches (8"); and any tree planted as a replacement tree for a tree removed pursuant to this chanter or planted within a required yar setback area pursuant to a landscape plan approved by the town council.

(10) "Significant tree," means any tree having a single trunk diameter greater than twelve inches (12"), or any tree designated to be preserved on plans approved by the town council, or as a condition of approval of a project approved by the town council.

(11) "Tree," means a perennial plant having a permanent, woody, self-supporting main stem or truck ordinarily growing to a considerable height. As defined herein, a "tree" may include a shrub as well as a tree.

(13) "Unimproved parcel," means any parcel in Ross which does not have a structure on it suitable for human habitation.

12.24.060 Alteration or removal of trees on unimproved parcels. The following provisions apply to the alteration or removal of trees on unimproved parcels:

(1) It is unlawful for any person to alter or remove, or cause to be altered or removed, any tree six inches (6") in diameter or greater on an unimproved parcel in Ross without first obtaining a Tree Alteration or Removal Permit from the Public Works Director.

(2) Any person desiring to alter or remove a tree on an unimproved parcel must file for a Tree Alteration or Removal Permit following the application procedure as described in Section 12.24.080.

12.24.070 Alteration or removal of trees on improved parcels. The following provisions apply to the alteration or removal of trees on improved parcels:

(1) No protected or significant tree shall be altered or removed without a Tree Alteration or Removal Permit.

(2) Any person desiring a Tree Alteration or Removal Permit must file for approval following the procedure as required by Section 12.24.080.

12.24.080 Tree Alternation or Removal Permits and Appeal. (4) Replacement tree. Unless otherwise specified by the Public Works Director or Town Council, replacement trees shall be required at the following ratios:

(a) A tree in good or excellent condition and structure shall be replaced on a one-to-one trunk diameter basis. (Example: 1 21″ dbh tree in good or excellent condition must be replaced with new trees totaling 21″ trunk diameter);

(b) A tree in fair or marginal condition or structure shall be replaced on a three-to-one trunk diameter basis. (Example: a 21″ dbh tree in fair or marginal condition must be replaced with new trees totaling 7″ trunk diameter);

(c) A tree in poor condition or creating a hazard to a building and/or structure, shall be replaced with 2 inches replacement trunk diameter.

Inches of replacement tree may be translated into standard nursery planting sizes using the following formulas:

24″ box replacement tree = 2 inch replacement trunk diameter

36″ box replacement tree = 3 inch replacement trunk diameter

48″ box replacement tree = 4 inch replacement trunk diameter

If native species are removed, replacement trees shall be of a species native to those lands that now constitute the Town of Ross, or a non-native species approved by town staff based on specific site circumstances. Replacement trees should have the same mature size as the trees that have been removed, unless town staff recommends otherwise based on specific site circumstances. If there is a conflict between arborists regarding the condition or structure of a tree, the town arborist's decision shall control. The Town Council or Public Works Director may reduce the number of replacement trees or the tree replacement ratio, as applicable, if the reduction will not negatively impact the environmental functions and value of the urban forest or the aesthetic values of the community.

The applicant shall complete tree replacement within sixty (60) days of tree removal, unless the Town has approved a longer time. Failure to plant required tree replacement may subject the property owner to Administrative Penalties under Chapter 9.70 until the replacement trees are planted.

12.24.100 Tree protection plan. In order to protect trees during construction of a project and thereafter, and to maximize the chances of their subsequent survival, a tree protection plan shall be required on sites where Significant or Protected trees may be impacted. The tree protection plan shall include a certified arborist's report on existing conditions as well as a plan for tree protection during construction

Town of Ross General Plan

The following policies of the Ross General Plan related to biological resources are applicable to the project (Town of Ross, 2007).

Goal 1. An Abundance of Green and Healthy Natural Systems

1.1 Protection of Environmental Resources. Protect environmental resources, such as hillsides, ridgelines, creeks, drainage ways, trees and tree groves, threatened and endangered species habitat, riparian vegetation, cultural places, and other resources. These resources are unique in the planning area because of their scarcity, scientific value, aesthetic quality and cultural significance.

Goal 6. Protecting Creek Habitat and Reducing Flooding Hazards

6.7 Riparian Vegetation. Protect existing creek and riparian vegetation and encourage the use of native species during creek restoration. Assure that modification of natural channels is done in a manner that retains and protects creekside vegetation, integrates fish passage and includes habitat restoration in its natural state.

Marin County Flood Control and Water Conservation District

The Marin County Public Works Department maintains the public infrastructure of Marin County, including its roads, bridges, flood channels, and natural creeks. Within the Public Works Department, the Marin County Flood Control and Water Conservation District (Flood Control District) works to reduce the risk of flooding for the protection of life and property while utilizing sustainable practices. The Flood Control District aims to meet this mission through effective, transparent, and responsive planning, design, construction, operation, and maintenance of facilities such as stormwater pump stations, flood diversion and storage basins, bypass drains, creeks, ditches, and levees. All project elements would be designed to comply with the District's own policies and to obtain and comply with any necessary permits.

3.3.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it would:

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, and coastal) 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. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan; or

Given the nature and location of the project, impacts are analyzed in this section relative to the following additional threshold:

g. Introduce a new non-native or invasive species of plant or animal into an area.

Approach to Impact Analysis

The following approach was used to inform the analysis of potential project impacts on biological resources. The potential for special-status species, protected habitats, wetlands, or riparian areas to occur in or near the project area was first assessed (see Section 3.3.3 for this assessment). Next, the project actions were considered to evaluate whether direct or indirect impacts on these resources were likely. Finally, the magnitude of any of those impacts was weighed against the significance criteria. More detail on these steps is presented in the following paragraphs.

Type of Impacts

Direct impacts occur through direct interaction of the resource with construction or operation and maintenance of the project. Direct impacts on plant and wildlife species are caused by loss of habitat in these communities at the time of ground disturbance. Site excavation, grading, filling, and infrastructure construction can also result in direct impacts from death, injury, or

disturbance (e.g., noise) to individuals to such an extent that the species cannot continue inhabiting or foraging in the area during construction (temporary impact) or over the life of the project operation and maintenance (permanent impact).

Direct impacts on natural communities include removal of these communities and replacement with other land uses. Direct impacts on habitat may be temporary—for example, if construction of the project disturbs a habitat that is subsequently restored, or individuals of a given species are displaced temporarily and then later return to the site. Impacts are considered permanent if the habitat is converted to some other type that no longer provides value to biological resources and the impacts persist past the operational period of the project.

Indirect impacts from a project may occur later in time, at a different location, or as the result of a sequence of related interactions (State CEQA Guidelines Section 15064[d][2] and [3]). Indirect impacts on species may occur when remaining fragments of undeveloped habitat are isolated from larger areas of contiguous habitat and individuals of a species suffer reductions in fitness or reproductive capability in these smaller fragments. Indirect impacts may occur concurrent with project implementation or at a later time due to degraded water quality, changes in hydrology, increased predation or competition, invasive species spread, and other indirect factors.

Significance Thresholds

The threshold for significance for impacts on special-status plants, fish, and wildlife would be any measurable decrease in population. A temporary impact would be significant if it resulted in a measurable alteration of the habitat that would result in a drop in the population of special-status species, such as changes in food supply, reduction in habitat elements needed for breeding, or changes that limit opportunities for cover and movement. For listed fish or wildlife and fully protected species, any loss of individuals would be a significant impact. For habitat modification, a significant impact is any measurable alteration of the habitat that would result in a drop in the population of special-status species, such as changes in food supply, reduction in habitat elements needed for breeding, or changes that limit opportunities for cover and movement. The threshold for significance for adverse effects on natural communities would be any reduction in extent of the community compared with baseline, or a change that could threaten the long-term existence of the community itself. The threshold of significance for wetlands is any net loss of extent. The threshold of significance for species migration would be the permanent interference in or inhibition of movement. The threshold of significance for local ordinances is a violation of any such ordinances. The threshold of significance related to invasive species is the introduction or spread of new non-native or invasive species.

3.3.6 Impact Discussion

Impacts Avoided

Due to the nature of the project, there would be no impacts related to the following criteria; therefore, no impact discussion is provided for the reasons described below:

1. **Criterion (f):** Implementation of the project would not conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat conservation plan because there are no adopted HCPs, NCCPs, or other approved conservation plans in the project area.

Impacts Analyzed

Impact 3.3-1: The project would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	Significance determination
	Construction: Less than significant with mitigation
	Operation and Maintenance: Less than significant

Construction

Direct Impacts

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

Plants

Sixteen special-status plant species have the potential to occur in the riparian corridor in Unit 4 upstream of the existing Denil fish ladder. Construction activities including vegetation removal, tree removal, fence installation, grading, and installation of streambed stabilization measures could result in the direct mortality or damage to special-status plant species. Special-status plants may be present in the areas where construction activities may be performed; without surveys to document these species and measures to adequately protect them, they could be removed and/or habitat would be degraded. The removal of special-status plants or damage to their habitat would be a significant impact. To avoid or minimize this significant impact, the project would implement special-status plant avoidance **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities**. Mitigation Measure 3.3-1a requires focused surveys for rare plants during the appropriate blooming season prior to construction and either avoidance of rare plant occurrences with a minimum 10-foot buffer or transplant and compensatory mitigation of any special-status plants that cannot be avoided. Because the mitigation requires avoidance of special-status plants or compensatory mitigation to offset any unavoidable impacts to special-status plants, the direct impact on special-status plants would be less than significant with mitigation.

Aquatic Species

Direct impacts on special-status aquatic species could occur from channel-bank stabilization (e.g., installation of rock and retaining wall), fish ladder demolition, and in-channel grading as well as dewatering activities in Unit 4. Project construction has been scheduled to allow

in-water work only during the period of June 15 to October 15, when creek flows will be low and special-status aquatic species are less likely to be present. However, the dewatering could potentially strand species if the dewatering were not completed carefully. In addition, contractors, if not properly trained, could work in unauthorized areas or in an unauthorized manner and potentially injure or kill special-status aquatic species. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1b: Fish Capture and Relocation** and **Mitigation Measure 3.3-1c: Environmental Awareness Training and Site Protection**. Mitigation Measure 3.3-1b specifies the requirements for careful dewatering and aquatic species relocation using approved techniques and qualified personnel to avoid significant impacts on aquatic species, and Mitigation Measure 3.3-1c requires contractor environmental awareness training to avoid working in unauthorized areas, during unauthorized periods, or any unauthorized manner that could cause an impact on special-status aquatic species. Because the mitigation includes specific procedures to avoid killing or injuring aquatic species during in-water construction, impacts on special-status aquatic species would be less than significant with mitigation.

Terrestrial Species

There will be no direct impacts on special-status terrestrial species associated with tidal marsh habitats, including California Ridgway's rail or salt marsh harvest mouse, as no habitat for these species occurs in Unit 4. There will be no impact.

White-tailed kite, a fully protected species, could establish nests in riparian woodlands, which is the primary vegetation community in Unit 4 upstream of the existing Denil fish ladder. The peak breeding season for white-tailed kite is May through August. Up to 21 trees will be removed in Unit 4. Direct effects on white-tailed kite may include nest abandonment or premature fledging resulting from construction-related noise, vibration, and visual disturbance. Foraging kites and other migratory birds would be in open areas away from the project area and can keep away or disperse from temporary construction activities; therefore, effects to foraging kites and migratory birds are not anticipated. Impacts on white-tailed kite would be significant if a kite were nesting in a tree that needs to be removed as part of the project or in proximity to construction activity and the increased activity level resulted in nest abandonment. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds**. Mitigation Measure 3.3-1d requires implementation of either impact-avoidance work windows or pre-construction nesting bird surveys and construction buffers to avoid significant impacts on special-status and other migratory nesting birds; therefore, the impact on white-tailed kite would be less than significant with mitigation.

Unit 3 Frederick Allen Park (Town of Ross)

The Frederick Allen Park construction includes removal of the concrete channel, construction of a retaining wall, construction of short concrete floodwalls (approximately 2 feet tall), and excavation and grading within the channel and park to provide a natural floodplain and meandering low-flow channel, improved fish passage, increased low- and high-flow habitat for salmonids, reduced flood elevations, and natural benches and banks connecting to the park.

Approximately 144 trees would need to be removed within the Frederick Allen Park grading footprint if the USACE requires a 15-foot setback from the new floodwalls. Approximately 114 trees would be removed if a setback is not required. The improvements also include new landscaping and a realigned multi-use path within the park.

Plants

Ten special-status plant species have the potential to occur in the riparian corridor in Frederick Allen Park. Construction activities including vegetation removal, tree removal, fence installation, and excavation and grading within the park to provide creek-corridor widening could result in the direct mortality or damage to special-status plant species should they occur in the area. Focused special-status plant surveys have not been performed in the Frederick Allen Park area. Without surveys to document these species and measures to adequately protect them, special-status plants could be removed and/or habitat degraded. Removal of a special-status plant or habitat degradation would be a significant impact. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities**. Mitigation Measure 3.3-1a requires focused surveys for rare plants during the appropriate blooming season prior to construction and avoidance of rare plant occurrences with a minimum 10-foot buffer or transplant and compensatory mitigation of any special-status plants that cannot be avoided. Because the mitigation requires avoidance of special-status plants or compensatory mitigation to offset any unavoidable impacts to special-status plants, the impact on special-status plants would be less than significant with mitigation.

Aquatic Species

Direct effects on individuals of a special-status aquatic species could arise from construction within the concrete channel. Project construction has been scheduled to allow in-water work only during the period of June 15 to October 15, when creek flows will be low and special-status aquatic species are likely to be absent. However, the dewatering could potentially strand species if the dewatering were not completed carefully. In addition, contractors, if not properly trained, could work in unauthorized areas or in an unauthorized manner and potentially injure or kill special-status aquatic species. The District would avoid significant impacts by implementing careful dewatering and fish relocation using approved techniques and qualified personnel following **Mitigation Measure 3.3-1b: Fish Capture and Relocation** and conduct contractor environmental awareness training in accordance with **Mitigation Measure 3.3-1c: Environmental Awareness Training and Site Protection**. Because the mitigation includes specific procedures to avoid killing or injuring aquatic species during in-water construction, the impact on special-status aquatic species is less than significant with mitigation.

Terrestrial Species

Frederick Allen Park is relatively narrow, heavily used by the public, and likely subject to heavy bird-nest predation pressures from corvids (e.g., crows and jays) that are attracted by human use and trash. There will be no direct impacts on white-tailed kite or special-status terrestrial species associated with tidal marsh habitats (i.e., California Ridgway's rail, saltmarsh common

yellowthroat, San Pablo song sparrow, or salt marsh harvest mouse) as no habitat for these species occurs in Frederick Allen Park. No impact would occur.

Unit 3 Fish Pool Construction

Unit 3 would be modified to include up to 11 new 11-foot-wide and 24-foot-long fish pools that would be 1.5 to 3 feet deep and spaced approximately 150 feet apart in the channel.

Special-Status Plants and Terrestrial Species

There are no special-status plant species or terrestrial wildlife impacts associated with the proposed fish pools because no habitat for special-status plants or terrestrial wildlife occurs in the concrete channel where the larger fish pools would be constructed. Therefore, no impact on special-status plant species or terrestrial wildlife would occur during fish pool construction.

Aquatic Species

Instream activities would require channel dewatering to allow for equipment access, concrete demolition at specific fish pool locations, and construction of the new fish pools. Adverse impacts of these activities include injury or mortality of any fish species that could be inhabiting Unit 3 at the time of dewatering. As mentioned previously, all in-water work activities have been scheduled to occur between June 15 and October 15, when water levels will be low and aquatic species are less likely to occur in the work area. While the construction schedule reduces the risk on aquatic species, significant impacts could potentially occur if dewatering activities were not properly implemented and individuals were stranded in Unit 3. The project would implement **Mitigation Measures 3.3-1b: Fish Capture and Relocation** to avoid this significant effect. Mitigation Measure 3.3-1b requires careful dewatering and fish relocation using approved techniques and qualified personnel. Because the mitigation includes specific procedures to avoid killing or injuring aquatic species during in-water construction, the impact on special-status aquatic species would be less than significant with mitigation.

Unit 3 and Unit 2 Floodwalls and Granton Park Stormwater Pump Station

Plants

Eight special-status plant species have the potential to occur in the footprint of the stormwater pump station. Construction activities including vegetation clearing and site grubbing, tree removal, fence installation, excavation, and, potentially, floodwall construction could result in the direct mortality or damage to special-status plant species if they occur in the area. Focused surveys for special-status plants have not been performed in the area. Special-status plants may be present in the areas where construction activities may be performed for installation of the floodwalls or stormwater pump station. Without surveys to document these species and measures to adequately protect them, special-status plants could be removed and/or habitat degraded, which would result in a significant impact on special-status plants. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities**. Mitigation Measure 3.3-1a requires focused surveys for rare plants during the appropriate blooming season prior to construction and avoidance of rare plant occurrences with a minimum 10-foot buffer or transplant and compensatory mitigation of any special-status plants that cannot be avoided.

Because the mitigation requires avoidance of special-status plants or compensatory mitigation to offset any unavoidable impacts to special-status plants, the impact on special-status plants would be less than significant with mitigation.

Aquatic Species
The Unit 3 and Unit 2 floodwalls and the stormwater pump station do not involve work within the channel of Corte Madera Creek. Therefore, construction of the floodwalls and stormwater pump station would have no impact on aquatic species.

Terrestrial Species
White-tailed kite, a fully protected species, could establish nests in riparian trees associated with the Unit 3 and Unit 2 floodwalls and stormwater pump station. Construction activities for the Unit 3 and Unit 2 floodwalls and stormwater pump station include tree and vegetation removal, including removal of approximately eight trees for the stormwater pump station. If the floodwall is constructed as an extension of the existing channel wall, no additional riparian trees will need to be removed. If the USACE requires that the floodwall be set back from the existing floodwall or a 15-foot setback between the new floodwall segment and existing trees, then construction activities for floodwall construction will result in the removal of 157 trees. All native riparian trees removed within the location of floodwalls and project components would be replaced within proximity to the removal location unless it is infeasible to locate replacement trees within District property while maintaining a 15-foot setback from the floodwall to comply with USACE Section 408 requirements.

The peak breeding season for white-tailed kite is May through August. Direct effects on white-tailed kite may include nest abandonment or premature fledging resulting from construction-related noise, vibration, and visual disturbance. Impacts on white-tailed kite would be significant if a kite were nesting in a tree that needs to be removed as part of the project or in proximity to construction activity and the increased activity level resulted in nest abandonment. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1d Avoid Impacts to Special-Status Birds**. Mitigation Measure 3.3-1d requires implementation of either impact-avoidance work windows or pre-construction nesting bird surveys and construction buffers to avoid significant impacts on special-status and other migratory nesting birds. Because the mitigation includes procedures to avoid impacting an active nest of a special-status avian species, the impact on white-tailed kite would be less than significant with mitigation.

Unit 2 Lower College of Marin Concrete Channel Removal
The Unit 2 lower College of Marin concrete channel removal project activities includes removal of approximately 625 linear feet of concrete flood-channel wall to create approximately 0.35 acre of tidal and wetland habitats and 0.46 acre of upland transitional habitats. Habitat created in the earthen channel area would be planted with native vegetation at elevations that would accommodate sea-level rise so that the vegetation and habitat would be resilient to climate change.

Plants

Thirteen special-status plant species have the potential to occur in the Unit 2 concrete channel removal footprint. Construction activities including vegetation clearing, tree removal, and grading could result in the direct mortality or damage to special-status plant species. Surveys for special-status plants have not been completed in the area. Special-status plants may be present in the areas where construction activities may be performed. Without surveys to document special-status plant species and measures to adequately protect them, they could be removed and/or the habitat degraded. The impact from removal of special-status plants or habitat degradation would be significant. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities**. Mitigation Measure 3.3-1a requires focused surveys for rare plants during the appropriate blooming season prior to construction and avoidance of rare-plant occurrences with a minimum 10-foot buffer or transplant and compensatory mitigation of any special-status plants that cannot be avoided. Because the mitigation requires avoidance of special-status plants or compensatory mitigation to offset any unavoidable impacts to special-status plants, the impact on special-status plants would be less than significant with mitigation.

Aquatic Species

Grading and Dewatering. Removal of the existing concrete channel and regrading of the creek bed in tidal areas could cause injury or mortality of any fish species that could be inhabiting the Unit 2 work area at the time of construction. The project construction has been timed to limit in-water construction to the period of June 15 to October 15 to avoid the period when special-status fish are more likely to occur in the area. The Unit 2 construction has been timed to limit in-water construction to the period of September 1 to October 31 to avoid the period when special-status fish are more likely to occur in the area and after the Ridgway's rail breeding season. The construction in Unit 2 will require dewatering of the work area, and the dewatering of the intertidal reach could result in significant impacts on special-status aquatic species if not properly implemented.

The upstream extent of tidal action in Corte Madera Creek is in the vicinity of the Kentfield Hospital. However, at low tide channel between Stadium Way and the SMN Bridge would be substantially free of tidal water (Sandra Guldman, pers. comm. December 4, 2020). Construction within this reach would require installation of two cofferdams: one at the Stadium Way Bridge and a sheet pile structure downstream of the Unit 2 concrete channel. Fish species would be removed and relocated from the Unit 2 construction reach as described in the dewatering plan developed by the Friends of Corte Madera Creek (see Appendix D).

The District would implement **Mitigation Measure 3.3-1b: Fish Capture and Relocation** and **Mitigation Measure 3.3-1c: Environmental Awareness Training and Site Protection** to avoid significant impacts on aquatic species. Mitigation Measure 3.3-1b requires careful dewatering and fish relocation using approved techniques and qualified personnel. Mitigation Measure 3.3-1c requires contractor environmental awareness training to ensure all construction personnel follow authorized construction procedures to avoid impacts on special-status species.

It is expected that the Friends of Corte Madera Creek dewatering plan would reduce the impacts on fish present within the Unit 2 work area. However, depending on the tidal range at the time of construction, tidewaters could be present upstream of the Stadium Way Bridge cofferdam. Installation and closure of the cofferdam for up to eight weeks while potentially fish-bearing tidal water is upstream could result in the stranding and potential mortality of estuarine fish. Therefore, **Mitigation Measure 3.3-1f Intertidal Upstream of Stadium Way Cofferdam** that requires an inspection of the reach upstream of the Stadium Way cofferdam and fish removal would be implemented to avoid significant impacts on estuarine fish upstream of the Unit 2 work area.

Because the mitigation includes procedures to avoid injury or death of special-status fish during dewatering, the impact on special-status aquatic species from grading and dewatering would be less than significant with mitigation.

Noise. The proposed Unit 2 activity also includes pile driving to construct a cofferdam that would temporarily eliminate tidal action in the project reach and facilitate channel modifications. The noise generated during driving the pilings into the sediment of lower Corte Madera Creek has the potential to result in the injury or mortality of juvenile or adult salmonids that may be close to the work area.

The cofferdam would be constructed of sheet piles that would be driven into the substrate upstream of the Tamalpais Creek culvert using a Silent Piler Giken F101 vibratory pile driver. Approximately 175 piles will be driven side-by-side to install the nearly 225-foot-wide cofferdam, 40 feet of which will be located outside of the ordinary high tide line. The remaining pilings may be installed within the wetted low-tide perimeter, but much of the installation would occur during low-tide periods and on dewatered substrate.

The Fisheries Hydroacoustic Working Group (FHWG) has developed agreed-upon injury threshold criteria for listed fish species (FHWG, 2008). The FHWG identified sound pressure levels of 206 dB-peak (peak decibels) as being injurious to fish. Accumulated sound exposure levels (SEL) of 187 dB for fishes that are greater than 2 grams (g), and 183 dB for fishes below that weight, are considered to cause temporary shifts in hearing, resulting in temporarily decreased fitness (i.e., reduced foraging success, reduced ability to detect and avoid predators) (FHWG, 2008). It must be noted that recent research summarized in Popper et al. (2014) suggests that cumulative SEL thresholds for injury may be well above 200 dB.

The Silent Piler that will be used for this project has a noise level of about 63 dB at its fully operational mode. Therefore, the impact of the Unit 2 work and pile driving on fish species is less than significant.

Terrestrial Species

California Ridgway's Rail. California Ridgway's rail is known to occur within 1,000 feet of the furthest downstream portion of Unit 2. Saltmarsh common yellowthroat and San Pablo song sparrow, also special-status species, may nest in the coastal brackish marsh associated with Unit 2 at the downstream end of the project area. Heavy construction associated with the

concrete channel removal in lower Unit 2 is scheduled to begin after September 1, when California Ridgway's breeding season is complete.

Noise can negatively affect birds by causing them to lose hearing sensitivity temporarily or permanently or by increasing their stress levels by altering the production of stress hormones. Noise can also mask important background signals, thus preventing individuals from receiving important biological information such as sounds of predators or prey or through interfering with acoustic communications between individuals. The latter can interfere with finding mates and/or change how animals select foraging locations (Caltrans, 2016).

Laboratory evidence shows that continuous noise levels above 110 dBA (A-weighted decibels) lasting over 12 to 24 hours, or a single impulsive noise over 140 dBA SPL (125 dBA SPL for multiple blasts), can cause damage and loss of inner ear sensory hair cells, resulting in a large initial permanent threshold shift (PTS) followed by a small (~10–15 dB) lingering threshold shift even after all hair cells have been regenerated (Caltrans, 2016). At continuous noise levels below 110 dBA down to about 93 dBA, birds may experience a temporary threshold shift (TTS) that lasts from seconds to days, depending on the intensity and duration of the noise to which the animal was exposed. In contrast to a PTS, hearing recovers completely from TTS to the level that it was before the exposure. Nevertheless, during this period of TTS, the bird's hearing is temporarily impaired, and this could affect a variety of auditory and vocal communication behaviors, including detection of predators, communication with young, auditory feedback, etc. Received continuous noise levels below 93 dBA SPL are unlikely to cause even TTS in birds (Caltrans, 2016). The noise-masking threshold is approximately 60 dBA.

The Silent Piler that will be used for this project has a noise level of about 63 dB at approximately 53 feet during its fully operational mode. This is barely above the noise-masking threshold and well below the TTS level that could be injurious to birds. The attenuation rate for construction noise is about 6 dB per doubling of distance (Caltrans, 2016). Furthermore, operation of the Silent Piler will occur after September 1, when the nesting season will be complete for special-status bird species. Therefore, the impact of pile driving on Ridgway's rail, saltmarsh common yellowthroat, San Pablo song sparrow, or other bird species is less than significant.

There is the potential for other construction noise to adversely affect special-status bird species, including Ridgway's rail. Heavy equipment operations and concrete channel demolition could generate sound pressure levels that are detrimental to nesting bird species. Bulldozers, excavators, and jackhammers produce noise levels of 85 dBA at 50 feet (Caltrans, 2016). Assuming that the noise attenuation rate is 6 dB per doubling of distance, the decibel level at the nearest observation (600 feet) of Ridgeway's rail to the project area would be about 63 dBA. Although this noise level is below the TTS injury threshold, it would result in noise masking, which could make nesting birds and young more susceptible to predation. Therefore, heavy equipment operations involving demolition, grading, or construction of the lower Unit 2 concrete channel removal will commence after September 1 to avoid the nesting season. Impacts

on special-status birds would be less than significant due to the timing of construction heavy equipment use after September 1.

Salt Marsh Harvest Mouse. Salt marsh harvest mouse has a very low likelihood to occur in the project area. However, because the species is federally and state listed as endangered and fully protected by CDFW, any impact on this species, if it occurred in the area, would be significant. The District will implement **Mitigation Measure 3.3-1g: Avoid Salt Marsh Harvest Mouse** to avoid impacts on salt marsh harvest mouse. Mitigation Measure 3.3-1g requires the following: environmental training for all crews by a Qualified Biological Monitor, flagging suitable habitat for avoidance, having a biological monitor present for all vegetation removal within 50 feet of wetland habitat, hand removal and salvage of wetland vegetation, installation of salt marsh harvest mouse exclusion fencing to avoid salt marsh harvest mouse from entering the work area, timing work to avoid extreme high tides, and capping pipes or similar objects in mouse habitat. Because the mitigation includes procedures to avoid salt marsh harvest mouse, the impact on salt marsh harvest mouse would be less than significant with mitigation.

Indirect Impacts

Plants

Indirect damage or degradation to special-status plant species or habitat could result from construction activities introducing invasive plant species to the project site. Invasive plant species could spread between construction areas as well as from outside the project. Invasive plant species could also colonize recently disturbed graded soils. The project includes planting of riparian vegetation along the creek banks to restore native habitats and seeding areas of temporary construction disturbance with a native seed mix, which would help prevent the establishment of invasive plant species. The proposed planting mix for Frederick Allen Park and lower College of Marin is provided in Appendix B. Native planting would help prevent the establishment of invasive plant species. However, the revegetation effort may adversely affect habitat by introducing nonnative plant species. In addition, construction vehicles or equipment could carry invasive plant seeds or pathogens into the work area. Introduction of invasive plant species could cause degradation of special-status plant habitat, which would result in a significant impact on special-status plants. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1e: Invasive Plant Species Control**. Mitigation Measure 3.3-1e requires washing of vehicle and specific requirements to prevent introduction of pathogens and invasive plant species during construction. Because the mitigation includes procedures to avoid introduction of invasive species, the indirect impact on special-status plants would be less than significant with mitigation.

Aquatic Species

Channel stabilization and fish ladder demolition in Unit 4 would result in modification of instream habitat from its current condition. Since its construction, the fish ladder has resulted in ongoing adverse modification of instream habitat in Unit 4 through sediment aggradation upstream. In addition, the presence of the fish ladder has adversely affected fish migration by hindering the ability of adult fish to pass at that location during high flows. Its dilapidated condition, the lack of an entrance pool in the concrete channel, and the narrow range of

operating flows makes the fish ladder relatively ineffective for fish passage (MLA, 2019). In addition, the fish ladder halts the upstream movement of juvenile Steelhead due to excessive jump height. The project will remove the fish ladder, grade and stabilize Unit 4 upstream of the fish ladder removal with engineered streambed material, install biodegradable fabric-wrapped soil lifts with intervening live willow brush layers, bury a large rock keyway to protect the transition element, and provide a short section of concrete retaining wall to protect the streambank. Unit 3 and Unit 2 of Corte Madera Creek are currently contained within a concrete channel, which contains very poor habitat for migrating and rearing aquatic species. Work within the channel would improve steelhead migration habitat by removing approximately 60,000 square feet of the concrete waterway adjacent to Frederick Allen Park and restoring it to a natural aquatic and riparian condition and installing larger fish resting pools.

The Unit 4 features would together result in approximately 6,375 square feet and 3,625 square feet of temporary and permanent aquatic habitat impacts, respectively. The temporary impact is related to channel grading and streambed stabilization, which would adjust during the following high-flow seasons and continue to provide suitable instream habitat. The permanent impact would occur due to rock keyway placement and the reinforced concrete retaining wall, which would be along the channel margins. Riparian habitat impacts would result from the removal of 21 trees, which would be replaced within Unit 4. Given the limited affected area, riparian vegetation replacement, and improved fish-migration habitat from removal of the fish ladder, the temporary and permanent impact on in-stream and riparian habitat from the project elements in Unit 4 are not expected to adversely affect populations of the special-status aquatic species in the Corte Madera Creek area and has the potential to beneficially affect instream habitat populations due to removal of a fish-migration barrier. Following implementation of the project, the Corte Madera Creek channel would be wider, with increased habitat diversity, such as natural pool/riffle sequences, which would improve habitat conditions for juvenile salmonids and amphibians. The planting of native riparian vegetation (e.g., willows and alders) along the restored channel would increase stream shading and help moderate water temperature conditions. In addition, the removal of concrete and restoration of the natural channel would allow for the interchange of subsurface and surface water, which could also help moderate water temperatures. Therefore, the impact would be less than significant and, ultimately, the project is anticipated to have a beneficial impact on aquatic species. The lower Unit 2 concrete channel removal activities are contained within a concrete-lined channel, which contains very poor habitat for aquatic species. The new tidal, wetland, and riparian habitat created by the project would improve rearing conditions for aquatic species. Therefore, impacts on aquatic species habitat are considered beneficial and less than significant.

Indirect impacts include increased turbidity and suspended sediment within the channel from post-construction rewatering and initial storm runoff. Sediment resuspension may also increase the concentrations in the water column of chemicals sequestered in the sediment with potential toxicity to salmonids and other aquatic species and may result in adverse water quality and biological effects. At high levels, turbidity and suspended sediment in the water column can lower levels of dissolved oxygen. However, after the initial spike in turbidity levels, sediments

would disperse and background levels would likely be restored within hours of disturbance. Persistent elevated levels of turbidity would constitute a significant impact on aquatic species and habitat. However, implementation of the project's erosion control measures in the Stormwater Pollution Prevention Plan and federal and state regulatory permits (Clean Water Act 404, Clean Water Act 401, etc.) would address this potential effect. Best Management Practices typical for civil construction projects will be implemented, such as straw wattles, silt fences, erosion-control matting, and stabilized construction entrances. Removal of the fish ladder would create long-term benefits for natural sediment processes. Therefore, indirect impacts on aquatic species due to increased turbidity and suspended sediment are less than significant.

Removal of trees and other vegetation in the riparian corridor could also adversely affect perennial stream habitat by reducing overstory shade at the project site, which may reduce habitat quality in downstream areas by increasing water temperatures, increasing algal growth, and lowering dissolved oxygen levels. Substantially depressed oxygen levels may cause respiratory stress to aquatic life and, when levels are depressed enough, may cause mortality. Persistent high water temperatures, algal growth, or low dissolved oxygen levels would constitute a significant impact on aquatic species and habitat. However, very few trees (i.e., seven) would be removed within Unit 4. Project activities in Frederick Allen Park, in the Unit 2 and Unit 3 floodwall installation area, and stormwater pump station would also require the removal of existing native and non-native upland trees to facilitate demolition of the concrete channel and associated restoration grading, installation of floodwalls, and installation of the stormwater pump station. Most of these trees are located away from the top of bank and do not provide shading to the channel. The trees along the top of bank provide minimal shading of the low-flow channel. In addition, the elevated water temperatures occur during the summer months due to the substrate heating of the very shallow water flowing over the hot concrete channel. The high water temperatures create inhospitable conditions for juvenile steelhead and other species. In addition, any trees removed from the riparian area would be replaced. There would not be significant changes in overstory shading and subsequent indirect water quality effects. Therefore, the impact on special-status aquatic species from tree removal is less than significant.

Terrestrial Species

As discussed above, removal of trees and other vegetation in the riparian corridor could reduce the number of trees available to nesting white-tailed kites in Unit 4 upstream of the existing Denil fish ladder, within Frederick Allen Park, and along the floodwalls in Units 3 and 2. Up to 358 trees would be removed. Any trees removed from the riparian area in Unit 4 would be replaced and up to 125 trees would be planted within Frederick Allen Park. Because of the heavy human activity and traffic in Frederick Allen Park, Frederick Allen Park does not currently provide habitat for special-status birds such as white-tailed kite. The removal of trees along the Unit 3 and Unit 2 floodwalls, if required by the USACE, and removal of trees at the stormwater pump station could reduce the number of nesting trees available to white-tailed kite. However, there are similar trees adjacent to the project area on private property available

to kites that would not be removed. The alteration and creation of riparian habitat would not result in a drop in any population of terrestrial special-status species. Because the project would result in a net increase in riparian habitat and there are numerous trees adjacent to the removed trees that would continue to provide habitat for white-tailed kite, the indirect impact on special-status terrestrial species from Unit 4, Frederick Allen Park, floodwall, and stormwater pump station implementation is less than significant.

The Unit 2 lower College of Marin concrete removal would create approximately 0.35 acre of tidal and wetland habitats and 0.46 acre of upland transitional habitats by removing or lowering approximately 625 lineal feet of concrete flood channel wall. Habitat created in the earthen channel area would be planted with native vegetation at elevations that would accommodate sea-level rise so that the vegetation and habitat would be resilient to climate change. The new tidal and wetland habitat created by this phase of the project would improve habitat conditions for special-status bird species including Ridgway's rail, saltmarsh common yellowthroat, and San Pablo song sparrow as well as for salt marsh harvest mouse. There would be no adverse impact on special-status terrestrial species. The lower College of Marin concrete channel removal will result in a long-term benefit to special-status terrestrial species.

Operation and Maintenance

Once constructed, the project would require ongoing operations and maintenance activities. Proposed operation and maintenance activities are described in Section 2.7. Vegetation management activities would be implemented to achieve three main goals:

1. Maintain channel flow capacity.
2. Reduce fire fuels.
3. Restore creek habitat by removing invasive nonnative plants and revegetating with native plants.

Unit 4 would likely not require maintenance due to the channel being in its natural state. However, vegetation management within the restored channel adjacent to Frederick Allen Park would be necessary to maintain channel flow capacity and ensure proper establishment of landscaping. Sediment management activities may be periodically required to maintain the constructed fish pools and flood capacity within the Frederick Allen Park channel and floodplain. Sediment management activities could include erosion control and repairs after storm events, particularly in the years immediately following construction while vegetation is establishing.

Plants

As the vegetation management activities do not include ground-disturbing activities and are focused on hand removal of nonnative vegetation and trees, operation and maintenance activities would have no impact on special-status plant species. Improved public access from Frederick Allen Park to the creek and adjacent riparian areas could result in trampling special-status plant species that may become established after project implementation. Without measures to educate the public, any newly established special-status plants could be impacted and/or the habitat degraded. Several project elements will minimize this potential impact

including (1) the short wall and split-rail fence that will be installed for safety at the top of the creek bank, which will help prevent inadvertent access; (2) educational signs that will be installed, which will educate the public about the importance of riparian areas and need to keep out of restored habitats; and (3) trash receptacles that will be placed in Frederick Allen Park, which will reduce the amount of trash that could enter the restored habitats. Because of the implementation of the above elements to reduce trampling of riparian vegetation, the impact on special-status plants would be less than significant.

Aquatic Species

Of the four types of maintenance activities, only vegetation management and sediment/debris removal have the potential to affect special-status aquatic species. The floodplain planting plan for Frederick Allen Park will utilize tree species with widely spaced single trunks and shrubs that would bend over during high flows. This would minimize sediment deposition during high flows and the need for maintenance adjacent to Frederick Allen Park. There is the possibility that sediment could deposit in the new fish migration pools; however, sediment removal from fish pools is currently part of the maintenance procedures for the creek within this area, and the removal of sediment by hand would not create new impacts on aquatic species or their habitat. Vegetation management would occur during low-flow periods when treatment areas are not within the wetted perimeter of the creek. If necessary, any sediment management would occur during summer low-flow periods and would occur outside of areas that could be occupied by fish. Therefore, impacts from operation and maintenance of the project would be less than significant.

As stated above, the increase in public access to the restored Frederick Allen Park floodplain could result in trampling of newly planted vegetation, which could retard the development of streambank riparian and aquatic habitat. The project elements (short fence, educational signage, and trash receptacles) would help reduce impactive public access. In addition, CDFW regulations prohibit fishing in Corte Madera Creek. Therefore, this impact would be less than significant.

Improved public access also provides an opportunity for local schools to develop field-based science curriculum that includes investigation into the species and physical and biological processes of Corte Madera Creek.

Terrestrial Species

The stormwater pump station is the only operable project element that would be installed as part of the project. The stormwater pump station would only operate during storm events, and the only noise-producing element of the stormwater pump station is the back-up generator, which would only operate during emergencies and during annual testing. Operation and maintenance of the stormwater pump station would have no impact on special-status terrestrial species.

Maintenance activities, including pump station maintenance and floodwall inspection and maintenance, will be similar to those maintenance activities currently conducted by the District

in the project area and would not affect special-status terrestrial species. The project will create higher value riparian habitat within Frederick Allen Park that would be suitable for special-status birds. The new habitat would have a beneficial impact on special-status terrestrial species.

Maintenance of the habitat and new recreational access to the channel and riparian habitat could impact nesting birds if they were to occur in areas of vegetation management or human access. The project includes installation of a split-rail fence to restrict access to new habitats and signs educating the public to stay out of the riparian vegetation. The vegetation management and erosion control activities conducted within Frederick Allen Park would be similar to activities conducted by the District in similar habitats throughout the watershed and would follow standard operating protocols and compliance with CDFW maintenance permits to avoid impacts on special-status species. The impact on special-status species would be less than significant.

Improved public access from Frederick Allen Park to the creek and adjacent riparian areas could result in increased human–wildlife interactions in the creek. However, there would be educational signs that would be installed to educate the public about the importance of riparian areas and need to keep out of restored habitats. In addition, trash receptacles would be placed in Frederick Allen Park to reduce the amount of refuse that could enter the restored habitats and attract corvids (e.g., jays, crows, ravens), which could prey on nesting birds. Therefore, the impact on special-status terrestrial species would be less than significant.

Mitigation: Implement Mitigation Measures 3.3-1a through 3.3-1g.

Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities. Prior to construction, the District shall have a qualified botanist conduct botanical surveys according to CDFW protocols (i.e., Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities [CDFW, 2018 or more current]) during the appropriate time(s) of year (i.e., surveys shall coincide with the phenological stage during which the potential special-status plant species are identifiable in the field—for example, in April and again in July) to determine if any potential special-status plant species or sensitive natural communities are located within or immediately adjacent to the project area. If construction is planned to begin prior to the completion of comprehensive botanical surveys (e.g., construction is planned for April 2022, but plant surveys are planned for April and July), then the District shall conduct comprehensive plant surveys the year prior to construction (e.g., in 2021). If no special-status plants or sensitive natural communities are observed during appropriately timed surveys by a qualified botanist, it is assumed the construction activity will have no impact on special-status plants or sensitive natural communities and no further action is required.

Immediately preceding construction, the District shall flag or otherwise mark (e.g., stake, fence) areas with special-status plants or sensitive natural communities within the

project area for avoidance, including a 10-foot radius buffer. The District also shall identify locations for equipment and personnel-access and materials staging that will minimize disturbance in riparian habitat and coastal brackish marsh. When heavy equipment is required, unintentional soil compaction shall be minimized by using equipment with a greater reach or using low-pressure equipment. A biological monitor shall be present during construction within a 10-foot buffer of special-status plants to ensure impacts are avoided.

If avoidance of any special-status plant is not possible, prior to construction the District shall coordinate with CDFW and/or USFWS to establish procedures for compensatory mitigation. These measures may include collection of seeds when mature (generally the beginning of plant senescence) and salvage and transplant of any special-status plants that would otherwise be impacted by construction activities. Mitigation ratios, location, and timing of transplants shall be determined in consultation with CDFW and/or USFWS, and the mitigation ratio will be at a minimum of 1:1. The District shall monitor the success of transplant establishment for a period of at least three years, or as otherwise required by CDFW and/or USFWS. Location of transplanted individuals shall be recorded using a submeter-accuracy global positioning system (GPS) to enable location of the special-status plant species during and after the monitoring period is complete.

Mitigation Measure 3.3-1b: Fish Capture and Relocation. If in-channel work requires dewatering, including for sediment-removal maintenance activities, fish shall be captured and relocated upstream of the project areas to avoid injury and mortality and minimize disturbance. The District shall implement the measures below and described in the fish rescue plans for the project, or whatever more stringent species-preservation and avoidance measures are imposed by resource agencies, including NMFS and CDFW, with jurisdiction over aquatic special-status species.

1. The name(s) and credentials of qualified biologist(s) to act as construction monitors shall be submitted to CDFW and NMFS for approval at least 15 days before construction work begins.
2. Prior to and during the initiation of construction activities, a qualified fisheries biologist (i.e., approved by CDFW and/or NMFS) shall be present during installation and removal of creek-diversion structures.
3. For sites that require flow diversion and exclusion, the work area shall be blocked by placing fine-meshed nets or screens above and below the work area to prevent salmonids from re-entering the work area. To minimize the potential for re-entry, mesh diameter shall not exceed 1/8 inch. The bottom edge of the net or screen shall be secured to the channel bed to prevent fish from passing under the screen. Exclusion screening shall be placed in low-velocity areas to minimize fish

impingement against the mesh. Screens shall be checked periodically and cleaned of debris to permit free flow of water.

4. The intakes of the cofferdam bypass pipes will be screened in accordance with the NMFS and CDFW fish screen criteria. This will prevent entrainment of fish species in the bypass facilities

5. Before removal and relocation on individual fish begins, a qualified fisheries biologist shall identify the most appropriate release location(s). In general, release locations should have water temperatures similar to (<3.6 degrees Fahrenheit difference) the capture location and offer ample habitat (e.g., depth, velocity, cover, connectivity) for released fish and should be selected to minimize the likelihood of reentering the work area or becoming impinged on exclusion nets or screens.

6. The means of capture shall depend on the nature of the work site and shall be selected by a qualified fisheries biologist as authorized by CDFW and NMFS. Complex stream habitat may require the use of electrofishing equipment, whereas in outlet pools, fish and other aquatic species may be captured by pumping down the pool and then seining or dip netting. Electrofishing, if necessary, shall be conducted only by properly trained personnel holding current permits from CDFW and NMFS and following the most recent NMFS electrofishing guidelines (NMFS, 2000).

7. Initial fish relocation efforts shall be performed several days prior to the scheduled start of construction and continue through cofferdam installation and work-area dewatering activities.

8. The fisheries biologist shall survey the exclusion screening throughout the diversion effort to verify that no special-status fish, amphibians, or aquatic invertebrates are present. Handling of fish shall be minimized. When handling is necessary, personnel shall wet hands or nets before touching them.

9. Prior to translocation, fish that are collected during surveys shall be temporarily held in cool, aerated, shaded water using a five-gallon container with a lid. Overcrowding in containers shall be avoided; at least two containers shall be used, and no more than 25 fish shall be kept in each bucket. Aeration shall be provided with a battery-powered external bubbler. Fish shall be protected from jostling and noise and shall not be removed from the container until the time of release. A thermometer shall be placed in each holding container, and cold blocks or partial water changes shall be conducted as necessary to maintain a stable water temperature. Special-status fish shall not be held more than 30 minutes.

10. If fish are abundant, capture shall cease periodically to allow release and minimize the time fish spend in holding containers.

11. Fish shall not be anesthetized or measured. However, they shall be visually identified to species level, and year classes shall be estimated and recorded.
12. Reports on fish-relocation activities shall be submitted to CDFW and NMFS in within two weeks following completion of in-channel operations.

Mitigation Measure 3.3-1c: Environmental Awareness Training and Site Protection. All construction personnel shall attend an environmental education program delivered by a qualified biologist prior to working in the project area. The training shall include an explanation as how to best avoid the accidental take of special-status species, including salmonids and other fish species, amphibians, reptiles, birds, and rare plants.

The training session shall be mandatory for contractors and all construction personnel. The field meeting shall include topics on species identification, life history, descriptions, and habitat requirements during various life stages. Emphasis shall be placed on the importance of the habitat and life-stage requirements within the context of maps showing areas where minimization and avoidance measures are being implemented. The program shall include an explanation of appropriate federal and state laws protecting endangered species and all mitigation measures that will be implemented to avoid significant impacts on special-status species. Each person will receive a training handout for their use and reference.

The contractor shall provide closed garbage containers for the disposal of all trash items (e.g., wrappers, cans, bottles, food scraps). Work sites shall be cleaned of litter before closure each day and litter placed in wildlife-proof garbage receptacles. Construction personnel shall not feed or otherwise attract any wildlife. No pets, excluding service animals, shall be allowed in construction areas.

Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds. If tree removal occurs outside of the nesting season, no surveys or monitoring would be needed. If tree removal or construction occurs in the nesting season (February 1 to August 31), a qualified biologist shall conduct a white-tailed kite and general nesting bird survey within the project area and areas within a 500-foot buffer from project construction. If active nests are identified, a no-disturbance buffer zone will be established around the nest as appropriate and in consideration of line-of-sight for the bird as well as existing human presence/activities around the nest when it was established; recommended buffers are 500 feet for white-tailed kite and non-listed raptors, and 25 feet to 250 feet for other non-listed birds as recommended by a biologist who is qualified to assess avian breeding behavior. Smaller buffers may be appropriate in the project area given the limited line of site due to existing development and anthropogenic disturbance in the area (e.g., traffic on Sir Francis Drake and adjoining areas). Construction work may continue outside of the no-work buffer.

Mitigation Measure 3.3-1e: Invasive Plant Species Control. All vehicles and equipment entering the project shall be washed to remove dirt, pathogens, invasive plant seeds, or invasive plant parts prior to entry on the project site. Particular attention shall be shown to the undercarriage and any surface where soil containing invasive plant seeds may exist. The District shall dispose of the waste material in an appropriate disposal facility. Arrangements shall be made for inspection of each piece of equipment before entering the project construction areas to ensure all equipment has been properly washed. The District shall follow these additional measures:

- Any permanent or temporary erosion control measures implemented to minimize erosion during and after construction shall be certified weed-free.
- Nursery operations that supply revegetation or seeding plant material must certify implementation of best management practices to reduce pest and pathogen contamination within their nursery, including of Phytophthora pathogens, the pathogen responsible for Sudden Oak Death (SOD).
- All tree removal and trimming activities shall include measures to avoid the spread of SOD (Phytophthora) pathogens. This may include, but is not limited to the following:
  - As a precaution against spreading the pathogen, pruning tools shall be cleaned and disinfected after use on confirmed or suspected infested trees or in known infested areas. Tools shall be sanitized before pruning healthy trees or working in pathogen-free areas. Chippers and other vehicles of mud, dirt, leaves, organic material, and woody debris shall be cleaned before leaving a site known to have SOD and before entering a site with susceptible hosts.
  - Crews shall be informed about the arboricultural implications of SOD and sanitation practices when they are working in infested areas.
  - Sanitation kits containing chlorine bleach, scrub brush, metal scraper, boot brush, and plastic gloves shall be provided to crews.
  - Shoes, pruning gear, and other equipment shall be sanitized before working in an area with susceptible species.
  - When possible, the District shall conduct work on SOD-infected and susceptible species during the dry season (June through October). When working in wet conditions, equipment shall be kept on paved, graveled, or dry surfaces and mud avoided. The District shall work in disease-free areas before proceeding to any infested areas.
  - If possible, soil or plant material (wood, brush, leaves, and litter) from host trees in any infested areas shall not be collected. Rather, material (e.g., wood, bark, brush, chips, leaves, or firewood) from tree

removals or pruning of symptomatic or non-symptomatic host plants shall remain on site to minimize pathogen spread.

- All reasonable methods to sanitize personal gear and crew equipment shall be used before leaving an SOD infested site. Accumulated soil and mud shall be scraped, brushed, and/or hosed off from clothing, gloves, boots, and shoes. Mud and plant debris shall be removed by blowing out or power washing chipper trucks, chippers, bucket trucks, fertilization and soil aeration equipment, cranes, and other vehicles. Movement of soil and leaf litter shall be restricted under and around infected trees as spores may be found there.
- Tools used in tree removal/pruning may become contaminated and shall be disinfected with alcohol or chlorine bleach.

Mitigation Measure 3.3-1f: Intertidal Upstream of Stadium Way Cofferdam. Prior to completing construction of the cofferdam near Stadium Way for the Unit 2 dewatering, an inspection of the reach upstream will be conducted to determine if tidal water is present at low tide. A fish removal/herding effort will be initiated if tidal water is present. The fish removal/herding effort will consist of a beach seine sweep beginning at the upstream end of tidal water and proceeding in a downstream direction to the Stadium Way cofferdam site. The impoundment structure could be completed once the sweeping action is downstream of the cofferdam. This action would ensure that estuarine fish would not be stranded in standing water upstream of the Stadium Way cofferdam and be subject to injury or mortality during the approximately eight weeks this reach would be cut off from tidal flux.

Mitigation Measure 3.3-1g: Avoid Salt Marsh Harvest Mouse. Prior to initiation of project work in potential salt marsh harvest mouse habitat, the areas and pathways to be affected will be flagged by construction personnel and verified by a Qualified Biological Monitor (including work areas, staging areas, and access roads/paths to these work and staging areas). The flagged areas(s) will include a two-foot perimeter buffer.

All wetland vegetation and other vegetation within 50 feet of wetland vegetation requiring removal will be removed under the supervision of the USFWS- and CDFW-approved Qualified Biological Monitor. This vegetation will be salvaged and maintained on site and will be replanted upon completion of construction activities. Vegetation removal shall start at the edge farthest from the salt marsh or the poorest habitat and work its way towards the salt marsh or the better salt marsh habitat. If a mouse of any species is observed within the areas being removed of vegetation, work shall be halted and the USFWS and CDFW shall be notified.

To prevent salt marsh harvest mice from moving through the project site during construction, temporary exclusion fencing will be placed around defined work area(s) identified by the Qualified Biological Monitor prior to the start of construction activities.

The fencing will be installed immediately after vegetation removal, with the two-foot buffer (cleared of vegetation) remaining between fencing and existing vegetation. The fence will consist of silt fencing (or similar material) and will be buried to a minimum depth of two inches so that mice cannot crawl under the fence. Fence height will be at least one foot higher than the highest adjacent vegetation, with a minimum height of two feet. All supports for the exclusion fencing will be placed on the inside of the work area. The fencing will be immediately removed upon project completion.

Prior to the start of daily construction activities, the Qualified Biological Monitor will inspect the exclusion fencing to ensure that it is functional (e.g., has no rips or tears and remains buried in the ground). The fenced area(s) will also be inspected to ensure that no mice are trapped there. Any mice suspected to be salt marsh harvest mice that are found along and outside the fence will be closely monitored until they move away from the construction area.

To prevent potential entrapment of salt marsh harvest mice in work equipment, pipes or similar objects located in salt marsh harvest mouse habitat will be capped prior to the end of the workday and then inspected by the biological monitor prior to commencement of work activities the following day.

Work in or immediately adjacent to vegetated marsh areas, as identified by the Qualified Biological Monitor, will be scheduled to avoid extreme high tides because protective cover for mice is limited at this time. Specifically, no work will occur two hours before or after extreme high tides as directed by the Qualified Biological Monitor for 6.0 feet National Geodetic Vertical Datum (NGVD) or above, as measured at the Golden Gate Bridge, or adjusted to the timing of local extreme high-tide events in which the marsh plain is flooded.

Significance after Mitigation: Implementation of Mitigation Measures 3.3-1, 3.3-1b, 3.3-1c, 3.3-1d, 3.3-1e, 3.3-1f, and 3.3-1g would avoid and minimize both direct and indirect significant project impacts on special-status plants, aquatic species, and terrestrial wildlife as described in detail in the impact analysis above. The impact to special-status species would be less than significant with mitigation.

	Significance Determination
Impact 3.3-2: The project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: Less than Significant

Construction

Direct Impacts

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

Approximately 0.55 acre of riparian habitat are present within the project in Unit 4 upstream of the existing Denil fish ladder. To avoid and minimize impacts on riparian habitat, the geographic extent of adverse effects on vegetation related to project construction is limited to the construction footprint and the immediate vicinity of the project. Construction activities including vegetation removal, removal of 21 trees, grading, and installation of streambed stabilization measures will temporarily impact 0.54 acre of riparian habitat and permanently impact 0.01 acre of riparian habitat. Areas of temporary impacts will be revegetated with native riparian species through the installation of native plantings. The impact on riparian habitat would be significant if the riparian planting was not successful, causing a net reduction in riparian habitat. The District would implement **Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan** to avoid significant impacts on riparian habitat. Mitigation Measure 3.3-2a requires a Habitat Restoration and Monitoring Plan to ensure successful establishment of the proposed habitat restoration in the project area. Impacts would be less than significant with mitigation.

In addition, sensitive natural communities may be present in the riparian areas where construction activities may be performed; without surveys to document these communities and measures to adequately protect them, they would be removed and/or degraded. The removal of sensitive natural communities would be a significant impact. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities**, **Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan**, and **Mitigation Measure 3.3-2b: Tree Mitigation**. Mitigation Measure 3.3-1a requires identification of any sensitive natural communities prior to construction and either avoidance of sensitive natural communities with a minimum 10-foot buffer or minimized disturbance; Mitigation Measure 3.3-2a requires the development and implementation of a Habitat Restoration Monitoring Plan to restore native riparian habitat; and Mitigation Measure 3.3-2b requires mitigation for removal of any native trees. Impacts would be less than significant with mitigation.

Unit 3 Frederick Allen Park

Approximately 1.48 acres of urban/developed habitat are present within Unit 3. The vegetation within Frederick Allen Park consists of ornamental plantings that are maintained as part of the urban park setting, which are separated from the creek by a 10-foot-tall concrete floodwall; however, CDFW considers the trees within the park to be part of the riparian zone because of the proximity of the trees to Corte Madera Creek. Construction activities including vegetation removal, removal of trees (i.e., 113 trees if the USACE does not require a 15-foot setback from new floodwalls or 144 trees if the USACE requires a 15-foot setback from new floodwalls), fence installation, and excavation and grading will have 0.78 acre of temporary impacts to the park's ornamental plantings and no permanent impacts. The impacted vegetation is currently separated from the creek by a 10-foot-tall concrete wall and does not contribute to habitat in the creek. Areas of temporary impacts will be revegetated with fast-growing willows, alders, and other riparian vegetation to establish riparian habitat adjacent to the creek to provide shade over the channel (see planting plan in Appendix B). The impact on riparian habitat will be

beneficial due to the removal of the concrete channel, creation of native riparian habitat, and reconnection of the creek to its revegetated floodplain.

The construction in Frederick Allen Park will require removal of 68 oak trees. Oak trees are sensitive due to the loss of oak woodlands throughout the state. Even if the oaks are not within habitat defined as a sensitive natural community, the oak trees are considered sensitive within the context of CEQA and are protected under Public Resources Code Section 21083.4. The planting within Frederick Allen Park includes a limited number of oak trees because the created habitats will be riparian and there will be limited area for planting of upland oak trees. The loss of oak trees will be significant. The District would implement **Mitigation Measure 3.3-2b: Tree Mitigation** to avoid significant impacts on oak woodlands. Mitigation Measure 3.3-2b specifies the criteria for mitigation of oak trees and requires replanting of oak trees at a minimum ratio of 4:1 and up to 15:1 based on CDFW guidance. The impact on oak woodland would be less than significant with mitigation.

Unit 3 and Unit 2 Floodwalls and Stormwater Pump Station

Riparian and ornamental trees occur in the areas where the new floodwall segments will be installed in Units 3 and 2 and within the construction footprint for the stormwater pump station. Construction activities for the stormwater pump station, including vegetation clearing and grubbing, will result in the removal of eight trees. If the floodwall is constructed as an extension of the existing channel wall, no trees may need to be removed. If the USACE requires a setback floodwall or a 15-foot setback from the existing wall to the nearest tree, then construction activities for floodwall construction would result in the removal of up to 157 native and non-native trees. Removal of trees, including up to 50 oak trees, would result in a significant impact on oak woodlands. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-2b: Tree Mitigation.** Mitigation Measure 3.3-2b requires compensatory mitigation of trees that need to be removed as a part of the project, including mitigation planting of oak trees at a minimum 4:1 ratio. The impact on oak woodlands would be less than significant with mitigation.

Unit 2 Lower College of Marin Concrete Channel Removal

Approximately 0.23 acre of coastal brackish marsh, which is a sensitive natural community, is present within the area where the concrete channel will be removed in Unit 2. Construction activities including vegetation clearing, the removal of 39 trees, fence installation, concrete removal, and grading will have 0.11 acre of temporary impact and 0.12 acre of permanent impact on coastal brackish marsh. The concrete channel removal will result in the creation of approximately 0.35 acre of tidal and wetland habitats and 0.46 acre of upland transitional habitats, resulting in a net increase in riparian and tidal marsh communities. Areas of temporary impacts will be revegetated with native vegetation at elevations that would accommodate sea-level rise so that the vegetation and habitat would be resilient to climate change. However, sensitive natural communities may be present in the coastal brackish marsh where construction activities may be performed; without surveys to document these communities and measures to adequately protect them, they would be removed and/or degraded. The removal of sensitive natural communities would be a significant impact. To

avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1a: Avoid Special-Status Plants and Sensitive Natural Communities** and **Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan**. Mitigation Measure 3.3-1a requires identification of any sensitive natural communities prior to construction and either avoidance of sensitive natural communities with a minimum 10-foot buffer or compensatory mitigation; Mitigation Measure 3.3-2a requires the development and implementation of a Habitat Restoration Monitoring Plan to restore impacted native vegetation. Impacts would be less than significant with mitigation. Ultimately, the proposed project is anticipated to have a beneficial impact on riparian habitat and tidal marsh communities in lower Corte Madera Creek.

Indirect Impacts

Indirect damage or degradation to riparian habitat and/or sensitive natural communities could result from construction activities introducing invasive plant species or pathogens to the project site. Invasive plant species could spread between construction areas as well as from outside the project. Invasive plant species could also colonize recently disturbed graded soils. Marsh, riparian, and upland native vegetation would be planted along the creek banks to restore native habitats, and areas of temporary construction disturbance would be reseeded with a native seed mix, both of which would help prevent the establishment of invasive plant species. However, the revegetation effort may adversely affect habitat by introducing nonnative plant species. In addition, construction vehicles or equipment could carry invasive plant seeds or pathogens into the work area. Introduction of invasive plant species could cause degradation of riparian habitat and/or sensitive natural communities, which would result in a significant impact. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1e: Invasive Plant Species Control**. Mitigation Measure 3.3-1e requires washing of equipment and use of weed-free seed and revegetation material to avoid introduction of invasive plants. The impact would be less than significant with mitigation.

Operation and Maintenance

As the vegetation management activities do not include ground-disturbing activities and are focused on hand removal of nonnative vegetation and immature trees that have colonized and recruited within the channel, the impact of operation and maintenance activities on riparian habitat or sensitive natural communities is less than significant. Improved public access from Frederick Allen Park to the creek and adjacent riparian areas could result in trampling riparian habitat or sensitive natural communities. Without measures to educate the public, the habitat could be impacted or degraded. Several project elements will minimize this potential impact, including (1) the short wall or fence that will be installed for safety at the top of the creek bank, which will help prevent inadvertent access; (2) educational signs that will be installed, which will educate the public about the importance of riparian areas and need to keep out of restored habitats; and (3) trash receptacles that will be placed in Frederick Allen Park, which will reduce the amount of trash that could enter the restored habitats. The impact on riparian habitat and sensitive natural communities would be less than significant.

Mitigation: Implement Mitigation Measure 3.3-1a, Mitigation Measure 3.3-1e, Mitigation Measure 3.3-2a, and Mitigation Measure 3.3-2b.

Mitigation Measure 3.3-2a: Habitat Restoration and Monitoring Plan. The District shall prepare a Habitat Restoration and Monitoring Plan for revegetation prior to construction activities as detailed herein. The plan shall describe any required salvage and replanting protocols prior to and after construction is complete. The plan shall include, but not be limited to, protocols for replanting of vegetation removed prior to or during construction and management and monitoring of the plants to ensure replanting success pursuant to the most stringent requirements included in permits issued for the project. At a minimum, impacted trees greater than or equal to six inches diameter at breast height (dbh) shall be mitigated at a minimum of 1:1 replacement for nonnative tree species and 3:1 replacement for native tree species. Monitoring and any necessary maintenance of revegetated areas shall occur for a minimum of ten years.

The plan shall include procedures to achieve the following performance criteria and additional requirements of permits from the various resource agencies with regulatory purview over the project. At a minimum, replanted woody trees and shrubs shall have a minimum of 85 percent survival and vegetative cover shall be a minimum of 80 percent after five years of monitoring. Invasive species cover shall not exceed 1 percent. Additional monitoring shall be conducted if the revegetated areas do not meet the performance criteria in year five; any replacement plants shall be monitored with the same survival criteria for five years after planting.

Areas impacted by construction-related activity shall be replanted or reseeded with native trees, shrubs, and herbaceous perennials and annuals from the watershed under guidance from a qualified biologist. Local plant materials shall be used for revegetation of the disturbed area. The plant materials shall include local cuttings from the local watershed or from adjacent watersheds. Seeds shall be collected during the appropriate season, and the container plants shall be of an appropriate size for out-planting.

The Habitat Restoration and Monitoring Plan shall also address restoration of jurisdictional wetlands and waters. Temporary impacts to wetlands shall be restored on site with native wetland species under guidance from a qualified biologist. Permanent impacts to jurisdictional wetlands shall be mitigated for by replacement on or off site at a minimum 1:1 ratio or whatever more stringent requirements are included in the permits to be issued for the project.

The monitoring plan shall include annual monitoring of restored areas for at least five years. The plan shall contain vegetation management protocols, protocols for monitoring replanting success, and an adaptive management plan if success criteria are not being met. The adaptive management plan would include interim thresholds for replanting success and alternative management approaches, such as weed control, supplemental watering, or additional replanting to undertake if thresholds are not met.

Mitigation Measure 3.3-2b: Tree Mitigation. To mitigate for removal of any native trees in the project area or any trees greater than or equal to 6 inches located within the riparian corridor, the District shall replant trees on site, to the extent possible. The District will identify other suitable locations within the watershed if the project area is not large enough to support the replacement of all trees required for mitigation. If suitable mitigation sites are not located within the watershed, then additional sites will be identified within the County or beyond. All mitigation sites shall be coordinated with and approved by resource agencies. Alternatively, the District may contribute funds to the Oak Woodlands Conservation Fund, as established under subdivision (a) of Section 1363 of the Fish and Game Code to the extent allowed by CDFW. Mitigation ratios shall be developed in coordination with the relevant resource agencies (i.e., CDFW and RWQCB) and the Town of Ross and shall vary according to both the type of tree impacted (i.e., tree species, whether or not the impacted tree is native to California or nonnative, and tree size) and the location of the mitigation planting (i.e., trees planted outside of the watershed may be subject to higher mitigation ratios). Impact mitigation ratios shall be a minimum of 1:1 for nonnative tree species to 3:1 for most native tree species or on a trunk-diameter basis per the Town of Ross Municipal code (i.e., 1:1 trunk diameter for trees in good or excellent condition [e.g., one 21-inch tree removed in good condition shall be replaced by new trees totaling 21-inch trunk diameter], 3:1 trunk diameter for trees in fair or marginal condition [e.g., one 21-inch tree removed in fair condition shall be replaced by new trees totaling 7-inch trunk diameter], and trees in poor condition shall be replaced with tree[s] totaling two inches in truck diameter), whichever is greater. Impact mitigation ratios for oak trees are expected to range from 4:1 (for impacted oak trees that are 5 to 10 inches dbh) to 5:1 (for impacted oak trees that are 10 to 15 inches dbh) and 15:1 (for impacted oak trees greater than 15 inches dbh).

The District shall prepare a detailed Tree Mitigation Plan and obtain approval from CDFW for the Tree Mitigation Plan. Replacement oaks shall come from nursery stock grown from locally sourced acorns or from acorns gathered locally, preferably from the same watershed in which they are planted. The trees should be able to survive the last two years of the minimum five-year monitoring period without supplemental irrigation. If at any time the District identifies additional trees that need to be removed, the District shall first get written approval from CDFW, RWQCB, and the Town of Ross and the District shall revise the final plan to include additional tree plantings in accordance with agency-approved mitigation ratios. Based on final total of trees impacted by the project, the plan shall include the details of the number and species of trees to be planted, specific planting locations, maintenance and irrigation needs, monitoring requirements (i.e., five years monitoring plant vigor and growth), reporting requirements, and success criteria to be met before monitoring is concluded (e.g., survival rates, assessment of "good" overall tree vigor, and tree viability without irrigation). The plan shall be submitted to resource agencies for review and approval prior to implementation.

Significance after Mitigation: The mitigation measures would avoid loss of sensitive natural communities, address potential indirect impacts from introduction of invasive weeds, ensure successful restoration of riparian areas, and offset impacts on oak trees. Impacts would be less than significant with mitigation.

	Significance Determination
Impact 3.3-3: The project would not have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means.	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: Less than Significant

Construction

Direct Impacts

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

Protected wetlands occur as waters below the ordinary high-water mark in the creek in Unit 4 upstream of the existing Denil fish ladder. Construction activities including grading and installation of streambed stabilization measures, rip-rap, short cast-in-place concrete walls adjacent to existing concrete walls, engineered streambed material, and creek-toe protection as well as channel dewatering during construction will temporarily impact 0.36 acre of waters and permanently impact 0.04 acre of waters. Areas of temporary impacts will return to waters upon the completion of construction, and areas of permanent impacts will be offset both by the channel deepening and widening activities (i.e., lower channel floor elevations and approximately 115 feet of widened channel to increase hydraulic conveyance capacity) and planting with wetland-appropriate species, such that the project would result in no net loss of wetlands (or waters) within Unit 4. Due to the temporary nature of project impacts lasting only a few months the project work in Unit 4 would not result in permanent loss of wetlands, the impact on protected wetlands would be less than significant.

In addition, project elements that would place fill or dredge in jurisdictional waters of the U.S. and of the state (e.g., concrete and planted rock) would require a Clean Water Act Section 404 permit from the USACE and a Section 401 water quality certification from the RWQCB. These agencies' policies require no net loss of wetlands, which further ensures that significant impacts will be avoided. The project cannot be constructed without these agency approvals.

Unit 3 Frederick Allen Park

The concrete channel adjacent to Frederick Allen Park includes waters but no vegetated wetland areas. Construction activities including concrete wall and channel removal as well as channel dewatering during construction will temporarily impact 0.13 acre of waters. Areas of temporary impacts will return to waters upon the completion of construction, and impacts from the replacement of the concrete channel with natural substrate would widen the channel along the left and right banks, create a low bar or bench inundated by floods, provide a new floodplain bench, and improve aquatic habitat in the larger Corte Madera Creek watershed over the long term such that the project would result in no permanent loss of wetlands within Unit 3

and an overall increase in wetlands. Therefore, Unit 3 restoration is anticipated to have a beneficial impact on protected wetlands.

In addition, project elements that would place fill or dredge in jurisdictional waters of the U.S. and of the state (e.g., channel widening, floodplain bench) would require a Clean Water Act Section 404 permit from the USACE and a Section 401 water quality certification from the RWQCB. These agencies' policies require no net loss of wetlands, which further ensures that significant impacts will be avoided. The project cannot be constructed without these agency approvals.

Unit 3 Fish Pool Construction
The concrete channel in Unit 3 includes waters but no vegetated wetland areas. Construction activities including the addition and enlargement of 11 fish-migration resting pools as well as channel dewatering during construction will temporarily impact 1.74 acres of waters and permanently impact 0.06 acre of waters. Areas of temporary impacts (i.e., dewatering) will return to waters upon completion of construction. Areas of permanent impacts associated with the fish pools are associated with concrete removal and will expand the waters by 0.01 acre such that the project would result in no permanent loss of wetlands within Unit 3 and an overall increase in wetlands. The impact on protected wetlands would be beneficial.

In addition, project elements that would place fill or dredge in jurisdictional waters of the U.S. and of the state (e.g., concrete and planted rock) would require a Clean Water Act Section 404 permit from the USACE and a Section 401 water quality certification from the RWQCB. These agencies' policies require no net loss of wetlands, which further ensures that significant impacts will be avoided. The project cannot be constructed without these agency approvals.

Unit 3 and Unit 2 Floodwalls and Stormwater Pump Station
The Unit 3 and Unit 2 floodwalls and the stormwater pump station are located in upland areas. No wetlands occur within the construction area for the floodwalls or stormwater pump station. Therefore, there would be no impact on protected wetlands from these activities.

Unit 2 Lower Corte Madera Creek (Phase 2)
Protected wetlands occur as waters below the high-tide line in the creek in Unit 2. Construction activities including concrete channel removal, channel wall removal, and grading as well as channel dewatering during construction will temporarily impact 1.51 acres of waters and permanently impact 0.05 acre of waters, including brackish marsh. Areas of temporary impacts will return to wetlands upon the completion of construction. Areas of permanent impacts will create approximately 0.35 acre of tidal and wetland habitats and 0.46 acre of upland transitional habitats within the ruderal upland and/or urban areas currently present at this location, such that the project would result in no permanent loss of wetlands within Unit 2 and an overall increase in wetlands. The impact on protected wetlands would be beneficial.

In addition, project elements that would place fill or dredge in jurisdictional waters of the U.S. and of the state (e.g., grading, channel widening, concrete removal) would require a Clean Water Act Section 404 permit from the USACE and a Section 401 water quality certification

from the RWQCB. These agencies policies require no net loss of wetlands, which further ensures that significant impacts will be avoided. The project cannot be constructed without these agency approvals.

Indirect Impacts

Indirect damage or degradation to protected wetlands could result from increased turbidity or other impacts related to water quality during construction. The project would disturb more than 1 acre and is required to obtain a Construction General Permit and prepare a Stormwater Pollution Prevention Plan (SWPPP), which would identify best management practices for reducing construction water quality impacts, such as erosion and sediment control measures. Indirect impacts to wetlands could occur from introduction of invasive species to wetland habitats. To avoid or minimize this significant impact, the project would implement **Mitigation Measure 3.3-1e: Invasive Plant Species Control**. Mitigation Measure 3.3-1e requires washing of equipment to avoid introduction of weed seed on vehicles and planting with weed-free materials to avoid introduction of invasive weeds through vegetation plantings. Impacts from invasive-species introduction to wetlands would be less than significant with mitigation.

Operation and Maintenance

As the vegetation management activities do not include ground-disturbing activities and are focused on hand removal of nonnative vegetation and trees, maintenance of the project would not impact protected wetlands. No routine maintenance, other than potential removal of storm flow or other man-made debris in lower College of Marin concrete channel removal area and, potentially, sediment and debris removal from fish pools is anticipated. The project would create new wetland habitats within Frederick Allen Park where the concrete channel is removed and riparian vegetation is planted and within the lower College of Marin concrete channel removal area where new salt marsh wetlands would be created. This impact would be beneficial because the project would result in a net increase in wetlands. Therefore, the impact on protected wetlands from operation and maintenance is less than significant.

Mitigation: Implement Mitigation Measure 3.3-1e.

Significance after Mitigation: Mitigation Measure 3.3-1e defines procedures to avoid introduction of invasive weeds in site construction and restoration activities. Indirect impacts on wetlands would be less than significant with mitigation.

	Significance Determination
Impact 3.3-4: The project would not 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.	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: Less than Significant with Mitigation

Construction

Aquatic Species Movement and Nursery Sites

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

Unit 4 work includes removal of the inoperable fish ladder and grading to create a smooth transition between Unit 3 and Unit 4. This work will require installation of cofferdams and dewatering of the channel, which will temporarily inhibit migration and use of the reach for rearing by salmonids. However, instream construction will occur from June 15 to October 15, which is after the juvenile smolting migration and prior to the arrival of adult salmonids in the fall. Fish would be able to return to the improved Unit 4 and post-fish ladder reach upon completion of construction. In addition, removal of the fish ladder will improve upstream and downstream migration and rearing habitat for salmonid species in the long term. Because the work would occur during periods when fish are not migrating, and the result would be to improve fish passage, this activity would have a less-than-significant impact on migratory fish or use of nursery sites.

Unit 3 Frederick Allen Park

The concrete channel adjacent to Frederick Allen Park currently presents a migration challenge for upstream migrating adult salmonids and downstream juveniles. This reach does not provide nursery habitat for aquatic species. Demolition of the concrete channel adjacent to the park and reconstruction of a natural channel will require dewatering, which will temporarily inhibit migration by salmonids. However, instream construction will occur from June 15 to October 15, which is after the juvenile smolting migration and prior to the arrival of adult salmonids in the fall. In addition, the restoration of the natural channel will improve upstream and downstream migration for salmonid species. This activity would have a less-than-significant impact on migrating fish.

Unit 3 Fish Pool Construction

Up to 11 larger fish pools would be constructed in lower Unit 3 downstream of Frederick Allen Park. This work would require dewatering, which will temporarily inhibit migration by salmonids. However, instream construction will occur from June 15 to October 15, which is after the juvenile smolting migration and prior to the arrival of adult salmonids in the fall. In addition, the construction of the fish pools will improve upstream and downstream migration for salmonid species. This reach does not provide nursery habitat for aquatic species. Therefore, this activity would have a less-than-significant impact on movement of migratory fish.

Unit 3 and Unit 2 Floodwall and Stormwater Pump Station

These activities would occur outside of the channel. There would be no impact on the movement of migratory fish.

Unit 2 Lower College of Marin Concrete Channel Removal

This portion of the project would remove the existing concrete channel walls and reconstruct natural streambanks. These activities would require installing a cofferdam and dewatering the channel, which would temporarily inhibit movement of migratory fish. This reach does not provide nursery habitat for anadromous salmonids but can be seasonally used by steelhead smolts as they transition from a freshwater to saltwater physiology prior to ocean entry. The construction is scheduled to occur between September and October 15 to avoid the fish

migration and smolt-transformation periods. The impact on fish migration and nursery habitat would be less than significant.

Wildlife Movement

The project is not expected to interfere substantially with the movement of any native resident wildlife species or with established native resident or migratory wildlife corridors. Larger animals, such as deer and coyote, are unlikely to make seasonal or life-cycle-driven movements through the project area beyond occasional dispersal movements of young animals. The project area provides habitat for localized wildlife movement and dispersal opportunities for wildlife that use the surrounding urban landscape, which is expected to remain unchanged.

Use of Native Wildlife Nursery Sites

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

Non-listed migratory birds or raptors could establish nests in riparian woodlands, which is the primary vegetation community in Unit 4 upstream of the existing Denil fish ladder. The nesting season for migratory birds and raptors is generally from February 1 to August 31. Up to 21 trees would be removed in Unit 4. Direct effects on avian nursery sites may include nest abandonment or premature fledging resulting from construction-related noise, vibration, and visual disturbance. Impacts on nesting birds would be significant if nesting in a tree that needs to be removed as part of the project or in proximity to construction activity and the increased activity level resulted in nest abandonment. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds**. Mitigation Measure 3.3-1d requires implementation of either impact-avoidance work windows or pre-construction nesting bird surveys and construction buffers to avoid significant impacts on migratory birds and raptors. This impact on nesting migratory birds and raptors would be less than significant with mitigation.

Twenty-one would be removed, and any trees removed from the riparian area would be replaced. The alteration of riparian habitat would not result in a substantial decrease in available nesting habitat for migratory birds and raptors. The indirect impact on nesting migratory birds and raptors would therefore be less than significant.

Unit 3 Frederick Allen Park

Frederick Allen Park is relatively narrow, heavily used by the public, and likely subject to heavy bird-nest predation pressures from corvids (e.g., crows and jays) that are attracted by human use and trash. Nevertheless, non-listed migratory birds or raptors could establish nests in trees slated for removal as part of the project. Impacts on nesting birds would be significant if an active nest tree is removed, or nesting is abandoned because of the increased activity associated with construction. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds**. Mitigation Measure 3.3-1d requires implementation of either impact-avoidance work windows or pre-construction nesting bird surveys and construction buffers to avoid significant impacts on nursery sites for nesting migratory birds and raptors. This impact on nesting migratory birds and raptors would be less than significant with mitigation.

The removal of 144 trees from Frederick Allen Park may further reduce nesting opportunities for migratory bird species. The removal of these trees would also increase the potential for edge-effect predation on nests in retained trees. The planting of native riparian vegetation (e.g., willows and alders) along the channel would improve overall habitat conditions for nesting birds by replacing non-native and ornamental landscaping trees with native habitats for nesting birds. The project includes a planting plan (Appendix B) that would revegetate the Frederick Allen Park area with between 88 and 125 trees, depending on whether a 15-foot setback is required from the floodwall. Up to 750 trees would also be planted off site to help offset tree removal and improve native nesting habitat in other areas (**Mitigation Measure 3.3-2b: Tree Mitigation**). Several of the trees that would be removed from Frederick Allen Park are currently unhealthy and many are nonnative and provide more limited habitat value than the trees that are proposed as part of the planting plan. The impact on nursery sites for migratory species from tree removal is less than significant with mitigation.

Unit 3 Fish Pool Construction
These activities would occur inside the concrete channel. There would be no impact on nursery sites for terrestrial birds.

Unit 3 and Unit 2 Floodwalls and Stormwater Pump Station
Non-listed migratory birds or raptors could establish nests in trees slated for removal as part of the Unit 3 and Unit 2 Floodwall and Stormwater Pump Station. Impacts on nesting birds would be significant if nesting in a tree that needs to be removed as part of the project or in proximity to construction activity and the increased activity level resulted in nest abandonment. To avoid or minimize these significant impacts, the project would implement **Mitigation Measure 3.3-1d: Avoid Impacts to Special-Status Birds**. Mitigation Measure 3.3-1d requires implementation of either impact-avoidance work windows or pre-construction nesting bird surveys and construction buffers to avoid significant impacts on migratory birds and raptors. This impact on nesting migratory birds and raptors would be less than significant with mitigation.

The project would remove up to 165 trees depending on the approved design for the floodwall in Units 3 and 2, the required setbacks from each floodwall, and construction of the stormwater pump station. The loss of up to 165 trees could result in a significant impact on available native wildlife nursery sites for native migratory birds and raptors. The District would implement **Mitigation Measure 3.3-2b: Tree Mitigation** to ensure adequate mitigation for tree removal, including replacement of trees removed at a minimum 1:1 ratio and higher, depending on the tree. The planting of native riparian vegetation would improve nesting habitat by replacing many non-native and ornamental trees with tree species that provide higher-quality nesting habitat. This impact is therefore less than significant with mitigation.

Unit 2 Lower College of Marin Concrete Channel Removal
The pile driving and concrete removal associated with this element of the project would occur after August 31 to avoid impacts on bird nesting areas. Therefore, impacts on nesting would be less than significant.

The project would remove up to 39 trees to facilitate the concrete channel removal. The loss of up to 39 trees could result in a significant impact on available native wildlife nursery sites for native migratory birds and raptors. The District would implement **Mitigation Measure 3.3-2b: Tree Mitigation** to ensure adequate mitigation for tree removal, including replacement of trees removed at a minimum 1:1 ratio and higher, depending on the tree. The planting of native riparian vegetation would improve nesting habitat by replacing many non-native and ornamental trees with tree species that provide higher-quality nesting habitat. This impact is therefore less than significant with mitigation.

Work within the existing wetland would result in the creation of approximately 0.35 acre of tidal and wetland habitats and 0.46 acre of upland transitional habitats within the ruderal upland and/or urban areas currently present at this location. This would result in an increase of potential salt marsh harvest mouse nursery habitat at this location. Therefore, this impact would be beneficial.

Operation and Maintenance

Operation and maintenance work would occur primarily within Units 3 and 2. Work within the channel would be limited to vegetation and sediment management. These activities would coincide with the low-flow period and would be very similar to the existing sediment removal and vegetation management activities conducted by the District in the project area and throughout the watershed. This impact would be less than significant.

> **Mitigation:** Implement Mitigation Measure 3.3-1d and Mitigation Measure 3.3-2b.
>
> **Significance after Mitigation:** Mitigation Measure 3.3-1d defines avoidance buffers for tree removal to avoid disruption of bird nesting activities. Mitigation Measure 3.3-2b ensures successful restoration of riparian areas and offsets impacts on oak trees. Impacts would be less than significant with mitigation.

	Significance Determination
Impact 3.3-5: The project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Construction

The objective of the project includes community flood risk reduction with the added benefits of improved fish passage, natural creek processes, and fish and riparian habitat adjacent to the Corte Madera Creek. The project is generally aligned and in conformance with the goals, policies, and codes described in the Marin Countywide Plan, Marin County Municipal Code, Town of Ross General Plan, and Town of Ross Municipal Code (See Section 3.3.4 for details regarding the specific goals, policies, and codes). The project would require removal of up to 165 trees (37 protected and 50 significant trees per the Municipal Code) within the Town of Ross. The District would be planting 89 to 125 trees in Frederick Allen Park. The project would also require removal of up to 47 protected or heritage trees within the unincorporated County. Although the District is exempt from obtaining a County permit for tree removal, the District

would voluntarily comply with County regulations regarding tree removals and replanting. The District would be required to obtain a tree removal permit from the Town of Ross and provide replacement trees as specified in the Town of Ross Municipal Code. Because the District would obtain a tree removal permit and comply with the Town of Ross tree protection ordinance, the impact from conflict with Town of Ross ordinance for the protection of biological resources would be less than significant. Because the District is exempt from the County tree protection ordinance and would voluntarily comply with the replanting requirements in the tree protection ordinance, the project would not conflict with any policy or ordinance for the protection of biological resources. The impact from conflict with a policy or ordinance for the protection of biological resources is therefore less than significant.

While the impact from conflict with a policy or ordinance for the protection of biological resources would be less than significant, the requirements of **Mitigation Measure 3.3-2b: Tree Mitigation** include tree replacement to comply with both Town of Ross and Marin County guidelines. The mitigation provides further guarantee that the project would not conflict with the Town of Ross or Marin County tree protection ordinances.

Operation and Maintenance

The project would create higher-value habitats that are consistent with the goals and policies for biological resources in the Town of Ross and Marin County. Project operation and maintenance will not require tree removal and will not conflict with any policies or ordinances protecting biological resources. No impact would occur.

Mitigation: None required.

	Significance Determination
Impact 3.3-6: The project would not introduce a new non-native or invasive species of plant or animal into an area.	**Construction: Less Than Significant with Mitigation**
	Operation and Maintenance: No Impact

Construction

Project construction could create a favorable environment for invasive non-native species that are highly competitive in disturbed environments. Unintentional introduction of non-native plant or animal species is also possible. Project activities would involve clearing, grubbing, in-water work, and excavation and grading using heavy equipment that could carry invasive non-native species or pathogens from outside sources to the project sites.

Plants

Introduction of new non-native or invasive plant species could result from construction activities. Invasive plant species could spread between construction areas as well as from outside the project. Invasive plant species could also colonize recently disturbed graded soils. Riparian vegetation would be planted to restore native habitats, and areas of temporary construction disturbance would be reseeded with a native seed mix, both of which would help prevent the establishment of invasive plant species. However, the revegetation effort may

adversely affect habitat by introducing nonnative plant species and/or pathogens on construction vehicles or equipment, which would be a potentially significant impact on special-status plant species or habitat. Establishment of invasive plants would be a significant impact. To avoid or minimize this significant impact, the District would implement **Mitigation Measure 3.3-1e: Invasive Plant Species Control**. Mitigation Measure 3.3-1e requires washing of equipment prior to construction and use of weed-free planting materials. The impact would be less than significant with mitigation.

Aquatic species

Corte Madera Creek is currently infested with New Zealand mud snails, which are a non-native invasive aquatic gastropod. This species might have been introduced by adhering to untreated fishing waders, kayaks, or other surfaces that were first used in infested waters and then introduced to Corte Madera Creek. Introduction of invasive aquatic species to the project area during construction and transferring species to other waterbodies after completion would be a significant impact. The District would implement **Mitigation Measure 3.3-6: Invasive Aquatic Species Control** to avoid significant impacts from invasive aquatic species. Mitigation Measure 3.3-6 defines specific requirements to ensure construction equipment and materials are free of invasive aquatic species. The impact from invasive aquatic species would be less than significant with mitigation.

> **Mitigation Measure 3.3-6: Invasive Aquatic Species Control.** All heavy equipment that has operated in waters outside of the Corte Madera Creek watershed shall be steam-cleaned and inspected prior to entering the project area. Any in-channel equipment that could be used in other water bodies will be decontaminated following the completion of the project. In addition, all waders, wading boots, block nets, dip nets, and buckets used within Corte Madera Creek will undergo decontamination. Decontamination protocols will include:
>
> - Freeze equipment/gear for a minimum of 8 hours at temperatures at 26°F (-3°C) or below.
> - Soak equipment/gear in a bath of hot water (at least 120°F, 46°C) for 10 minutes.
> - Soak equipment/gear in a bath of a disinfectant containing quaternary ammonium compounds (QAC) (e.g., Quat 4, Quat 128, Super HDQ Neutral, etc.) for 10 minutes. The QAC-containing disinfectant should be diluted with water at a rate to achieve a minimum active QAC concentration of 0.4%. Six (6) ounces of disinfectant to gallon of water can be used as a disinfectant to water ratio (1:21). After removal from the bath, rinse equipment/gear thoroughly with tap water.

Operation and Maintenance

Plants

The project management activities do not include ground-disturbing activities and are focused on hand removal of nonnative vegetation and trees. These activities would be beneficial to the

control of non-native and invasive plant species. The operation and maintenance would not increase the frequency of work in Corte Madera Creek or create other factors that could introduce non-native invasive species to terrestrial environments. No impact would occur from introduction of invasive species.

Aquatic species

As stated above, Corte Madera Creek is currently infested with New Zealand mud snails, which are a non-native invasive aquatic gastropod and have the potential to infest other waters. Any equipment used for operations and maintenance that enters the wetted perimeter of the creek shall be decontaminated using the procedures listed in **Mitigation Measure 3.3-6: Invasive Aquatic Species Control**. Implementation of Mitigation Measure 3.3-6 would result in this impact being less than significant with mitigation. Mitigation: Mitigation Measure 3.3-6.

Mitigation: Implement Mitigation Measure 3.3-6.

Significance after Mitigation: Mitigation Measure 3.3-6 requires cleaning of construction equipment prior to entering Corte Madera Creek. This measure also requires decontamination of waders and other materials used in the creek upon completion of operations and before transfer to other areas to avoid introduction and spread of invasive aquatic species. Impacts would be less than significant with mitigation.

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3.4 Cultural Resources

3.4.1 Introduction

This section presents and discusses the cultural resources located within the project area. Included in this section are the environmental and regulatory settings, the significance criteria used for determining environmental impacts, potential impacts associated with the project, and, where applicable, mitigation measures that would reduce those impacts to a less-than-significant level.

3.4.2 Scoping Comments

Comments related to cultural resources impacts were received during the public scoping process. These comments and the location where they are addressed in the cultural resources EIR analysis are provided in Table 3.4-1.

Table 3.4-1 Cultural Resources Scoping Comments

Agency/Entity	Comment	Location in Cultural Resources Section that Comment is Addressed
California State Lands Commission	The Draft EIR should also mention that the title to all abandoned archaeological sites and historic or cultural resources on or in the submerged lands of California is vested in the state and under the jurisdiction of the Commission (Pub. Resources Code, § 6313). Commission staff requests that the District consult with Staff Attorney Jamie Garrett, should any cultural resources on State lands be discovered during construction of the proposed Project. In addition, Commission staff requests that the following statement be included in the EIR's Mitigation and Monitoring Plan: "The final disposition of archaeological, historical, and paleontological resources recovered on state lands under the jurisdiction of the California State Lands Commission must be approved by the Commission."	3.4.5 Impact Assessment Methodology
Garril Page	I combine these two headings [Cultural Resources/Tribal Cultural Resources] as I have commented extensively on these subjects in prior EIR, and EIR/EIS opportunities. Having been told the USACE and County have collected such materials for inclusion in the current EIR, I herewith incorporate those Comments by reference. If, in fact, the current consultants have found and read my prior Comments, they have been advised regarding historical, cultural and tribal resources in Ross from 1960-2018. I assume the Town of Ross has mentioned relevant reports and resources for which Ross has contracted separately.	3.4.3 Environmental Setting, Project Setting, Record Search
Garril Page	I will add that the FAP Riparian Corridor proposes excavation and land disturbance in areas of early tribal settlements. The Project lead agency must exercise extreme diligence in honoring artifacts uncovered in the project area.	3.4.6 Impact Discussion (see also 3.14 Tribal Cultural Resources, 3.14.4 Regulatory Setting, Regional and Local Regulations)

3.4.3 Environmental Setting

Regional Setting

Human modification of the natural landscape in Marin County has changed the composition of the plant communities, habitats, and wildlife that use them. The most prominent activities are agriculture, livestock grazing, timber operations, road building, and urban and suburban development, all of which began in the nineteenth century and, with the exception of timber operations, persist into the present day. Urban and suburban development have contributed to considerable fragmentation of the natural areas. Within the project area, specifically, Corte Madera Creek was channelized in the 1970s, particularly at the downstream end of the project footprint. Furthermore, portions of the creek channel were lined with concrete.

Prehistoric Context

Information included in this prehistoric context is largely derived from Corte Madera Creek Flood Risk Management Project Draft EIS/EIR (USACE, 2018).

While there has been less archaeological research in Marin County as compared to other portions of the San Francisco Bay Region, research conducted in nearby areas (primarily Sonoma County) is germane to the prehistoric setting of the project area. This chronology is taken primarily from Basgall, et al. (Basgall, et al., 2006, in USACE, 2010) with other reference material cited as appropriate.

The Paleo-Indian Occupation dates from approximately 10,000 to 8000 B.C. There is scant evidence of this time period in areas surrounding Marin County, and none in Marin County itself. The cultural system in place during this time period is uncertain, but it has been suggested that the economic focus was on hunting with minimal to no reliance on vegetal resources (Fredrickson, 1984, in USACE, 2010).

The Lower Archaic Period follows the Paleo-Indian Occupation, lasting from approximately 8000 to 3000 B.C. There is little evidence of human occupation in Marin County for this time period. Evidence in the form of artifacts common to this time period have been found in nearby areas, such as at Duncan's Landing and Bodega Bay. Further south of Marin County, there are indications of millingstone-dominant archaeological assemblages starting circa 4500 B.C., which implies that a more diversified subsistence pattern including various vegetal resources had replaced the earlier focus on hunting. The scarcity of sites dating to this period along bayshore margins may be attributable to rising sea levels and inundation. The earliest radiometric dates of artifacts found in Marin County fall near the end of this time period, around 3500 B.C. This date was obtained at archaeological site CA-MRN-17, located at De Silva Island.

The Early Period, the next interval in the chronology, dates from approximately 3000 to 350 B.C. Occupational intensity increased during this period, with larger numbers of archaeological components identified at a greater number of locations. During the early part of this period, there was an emphasis on gathering food resources from marshes and seed-rich grasslands. Millingstones and handstones were common during this period, indicating that a more generalized gathering subsistence pattern, which began during the Lower Archaic Period,

continued during the Early Period. Other artifacts that are associated with this time period include large, concave-base dart points, lanceolate bifaces, perforated charmstones, mortars and pestles, grooved and notched netweights, and a variety of distinctive bead and ornament types. Burials during this period tend to be in flexed position with no apparent concern for orientation. Across the region, archaeological components dating to this period tend to be artifactually diverse and temporally disjunctive, implying that there may have been multiple cultural traditions and adaptive strategies in place across the landscape. One of the better-analyzed sites in the County is CA-MRN-152, the Pacheco site, located in the northeastern portion of the County.

The Middle Period followed the Early Period and lasted from approximately 350 B.C. to A.D. 800. A proliferation of sites dating to this period implies growing populations and increased attention to new habitat types (Hylkema, 2002, in USACE, 2010). Major semi-permanent villages appeared in several marsh/lacustrine areas in the region, including San Francisco, San Pablo, and Bodega Bays and Laguna de Santa Rosa. Archaeobotanical studies indicate that the range of exploited food resources expanded even further from previous periods. This finding implies that the gathering of a variety of resources intensified to keep up with a growing population. Artifacts associated with this period include round-bottom mortars, shaped pestles, numerous crude stone sinkers, net mesh gauges, heavy projectile points, finely made stone drills, quartz crystals with pitch, and a large variety of bone artifacts such as tubes, head scratchers, needles, awls, chisels, and daggers. An increased number of mortars and pestles indicate that acorns became a very important food resource. Burials consist of primary interment, usually with high numbers of grave-associated artifacts and beds of red ochre. There are several archaeological sites with components dating to this period in Marin County along the coast of San Pablo Bay, including CA-MRN-115, CA-MRN-168, CA-MRN-254, CA-MRN-524, and CA-MRN-601. Other sites dating to this period include CA-MRN-27 (near Tiburon), CA-MRN-26, and CA-MRN-255/H.

The final interval in the cultural chronology is the Late Period, dating from A.D. 800 to 1800. This period is characterized by even greater resource intensification than earlier periods, greater sedentism, and increased social elaboration. Other changes include a population shift away from lakes and estuaries to riparian contexts in the oak woodlands. In woodland areas, populations could focus on collecting and storing acorns, which during this period became the primary subsistence resource. Hinterlands were visited more often, and hunting of terrestrial mammals became more important as the economic focus shifted away from baysides to uphill settings. An increase in social complexity is evidenced by an increased number of non-utilitarian artifacts. All these changes are generally seen as indicative of the entrance of Coast Miwok groups into the area. The early part of this period is characterized by flat-based show mortars, shaped pestles, and small triangular-bodied, serrated obsidian projectile points. Bone artifacts include hairpins, awls, and needles, though fewer than in previous periods. Cremations are introduced, but primary inhumations are also still found; burials are often accompanied by “killed” mortars. The latter part of this period occurs just before European contact. Characteristic artifacts of the latter part of the period include flanged pestles, small

serrated and non-serrated obsidian arrow points, banjo and triangular-shaped shell pendants, and tubular bird bone artifacts including pyro-incised tubes, whistles, and beads. Cremations with grave-associated artifacts became the common burial form. Near the terminal portion of this period, historic-period artifacts include spikes, porcelain trade beads, and glass. Several sites with archaeological components dating to this period have been identified along San Antonio Creek, including CA-MRN-196, CA-MRN-371, and CA-MRN-374. In addition, six sites have been documented in the Gallinas Valley, and two sites near the city of Novato, CA-MRN-502 and CA-MRN-530.

Geoarchaeological Context

As a result of the dynamic nature of California's landscape, archaeological sites deposited over the last circa (ca.) 13,500 years (roughly the time that humans are known to have lived in California) have been subject to numerous geomorphic processes that have either buried, destroyed, or left these resources intact on the surface of the ground. These geomorphic processes can include alluvial fan deposition, fluctuating river courses, and related floodplain deposition. In general, most Pleistocene Age landforms have little potential for harboring buried archaeological resources as they developed prior to human migration into North America (ca. 13,000 years before the present [B.P.]). However, Late Pleistocene surfaces buried below younger Holocene deposits do have a potential for containing archaeological deposits. Holocene alluvial deposits may contain buried soils (paleosols) that represent periods of landform stability before renewed deposition. The identification of paleosols within Holocene Age landforms is of particular interest because they represent formerly stable surfaces that have a potential for preserving archaeological deposits.

Ethnographic Context

Information included in this Ethnographic Context is largely derived from Corte Madera Creek Flood Risk Management Project Draft EIS/EIR (USACE, 2018).

The project area lies within the traditional territory of the Coast Miwok people. Miwok is a Penutian language with three groups within California: the Lake Miwok, located to the south of Clear Lake; the Eastern Miwok, located in the Sierra Nevada foothills; and the Coast Miwok, located on the North Bay and adjacent to the coast. The Coast Miwok, in turn, have been divided into two major dialect groups: the western, or Bodega, and the southern, or Marin (Kelly, 1978, in USACE, 2010). The project area lies more specifically within the territory of the Habasto group, the nearest ethnographic village of which was named *Awani-wi*, which was located near Mission San Rafael (Milliken, 1995, in USACE, 2010).

The Coast Miwok lived in an area with diverse terrain and varied food resources. Some animal foods such as deer and crab were available year-round, but in general, subsistence practices followed an annual cycle. During the spring, food resources included small fish, greens, pinole seeds, blue dick bulbs, and other marsh and bay resources. The economic focus shifted to upland areas for hunting and gathering various vegetal resources, especially seeds and buckeye, during the summer. Acorns and hazelnuts were collected in the fall and stored for the

winter. Salmon and trout were gathered during the winter runs. Other winter resources included geese, mud hens, and stored foods.

Conical grass-covered dwellings with slightly excavated central hearths were the most common type of housing. Tule or sedge mats were used to cover the floor. Each dwelling accommodated from six to ten nuclear or extended family members. During most of the year, the Coast Miwok appear to have resided in small camps close to resource gathering sites. As winter approached, they would return inland to the winter village, which was commonly located next to a stream and acorn supply (Basgall, et al., 2006, in USACE, 2010). This village usually consisted of a maximum of ten houses and contained more substantial structures, such as a large earth oven, a dance house, and one or possibly two sweathouses. Both the sweathouse and the dance house were semi-subterranean pole-and-stick structures covered in brush, grass, and earth (Kelly, 1978, in USACE, 2010).

Coast Miwok groups lived in small autonomous political entities comprised of intermarried families of some two to four hundred people (Milliken, 1995, in USACE, 2010). These groups were often led by a male headman, called a *capitán* by the Spanish. This tribal leader's role was limited, and the office was not necessarily inherited; the tribal leader acted as more of an advisor and coordinator, settling internal disputes and organizing labor for communal ceremonies and hunts. Women also held important leadership roles, organizing and overseeing numerous activities, particularly ceremonial festivals such as the Acorn Dance, *sünwele* dance, and certain aspects of the Bird Cult (Kelly, 1978, in USACE, 2010). Local groups interacted with neighboring groups through trade, feasts, seasonal ceremonial dances, and marriage. Both sexes acted as doctors.

The material culture of the Coast Miwok reflects a balance between what was locally available and what could be obtained through trade. As common to most California groups, basketry was a well-developed art among the Coast Miwok, and baskets were used for multiple functions. Twined baskets were most often used for cooking, storage, and seed processing, as burden baskets, and for other utilitarian functions. Coiled baskets, produced with the aid of bone awls, were more often used for decorative and ceremonial functions, commonly being adorned with woodpecker and duck feathers, abalone, and clamshell pendants. Other textiles included nets for fishing and rabbit skin blankets or capes. Ground stone-milling equipment was essential for processing the multitude of plant and seed resources utilized by the Coast Miwok. Obsidian, obtained through trade, was a preferred source for arrow-sized projectile points and butchering knives, while green chalcedony was preferred for general utility knives (Basgall, et al., 2006, in USACE, 2010; Kelly, 1978, in USACE, 2010). Animal bone was used to make various implements from hide scrapers, fishhooks, and needles to labrets and bird bone whistles. Olivella and abalone shell was most often used to make beads and pendants, while clamshell was used to make disk-shaped beads to be used as currency throughout Central California in later times.

The Coast Miwok were visited by Sir Francis Drake in 1579 and by Sebastian Rodriquez Cermeno in 1595. Exploration of the Petaluma River again brought Europeans into Coast

Miwok territory in 1775; however, extended encounters with European settlers did not occur until the following year, with the establishment of the Presidio of San Francisco and Mission San Francisco de Asís (Hoover, et al., 2002, in USACE, 2010). In 1817, Mission San Raphael Arcángel was established within Marin County, and the local Native Americans began to be recruited there. By the 1820s, a large percentage of Coast Miwok were associated with the missions. European-carried diseases had taken their toll on Native American populations since contact, but an outbreak of smallpox in 1837 was particularly severe for the Native Americans in Marin, Sonoma, Napa, and Solano counties. This outbreak, originating from Fort Ross, caused the death of an estimated 60,000 to 70,000 Native Americans (Basgall, et al., 2006, in USACE, 2010).

Historic Background

Information included in this Historic Context is largely derived from Corte Madera Creek Flood Risk Management Project Draft EIS/EIR (USACE, 2018). The Town of Ross is in what was once the 8,877-acre Mexican land grant Rancho Punta de Quentin Canada de San Anselmo. This grant was given to Captain Juan B. R. Cooper in 1840 and later sold to James Ross in 1857 (Town of Ross, 2007). James Ross, for whom the Town of Ross is named, was a Scotsman from Australia who made his fortune in the wholesale liquor business (Jose Moya de Pino Library, et al., 2009, in USACE, 2010). After purchasing the lands for $50,000, he moved there with his wife, Annie Ross, and their three children. Their home was located at 111 Redwood Drive (Jose Moya de Pino Library, et al., 2009, in USACE, 2010). Ross sold timber from his lands and established a trading post at the mouth of Corte Madera Creek named Ross Landing (now Kentfield Corners), which is located at the intersection of Sir Francis Drake Boulevard and College Avenue. From the trading post, packet schooners made runs to and from San Francisco three times a week. In 1862, James Ross died, and his wife was forced to sell a portion of the land holdings. The remaining 297 acres she retained are in the jurisdictional boundary of the Town of Ross today.

In 1863, Annie Ross, James Ross's eldest daughter named for her mother, married George Austin Worn. The following year, the couple created an estate they named Sunnyside. The first building constructed on the estate was the Octagon House, which is today home to the Jose Moya del Pino Library and the Ross Historical Society (Jose Moya de Pino Library, et al., 2009, in USACE, 2010). The Worns were also interested in horticulture. Many of the plants they brought back from their travels around the world form the foundation of the gardens at the current Marin Art and Garden Center, which was established on the Sunnyside grounds in 1945. The magnolia tree that stands in the middle of the Center's lawn was also planted by the Worns in the 1860s.

In 1873, the North Pacific Railroad acquired a right-of-way to run a steam railroad through Ross Valley, and in 1882, Annie Ross, James Ross's widow, deeded 1.4 acres of land to the railroad with the stipulation that the station they built be named in the memory of her husband and son (Jose Moya de Pino Library, et al., 2009, in USACE, 2010). Soon after, the first post office was opened in the area, in 1887. Now that the valley had an established route of transportation and communication, many prosperous families from San Francisco began to set up country estates

in the area. In 1908, the first Ross firehouse was erected, and the Town of Ross was incorporated.

One of the first actions of the new town was to improve transportation routes throughout the city by paving streets and erecting streetlights. One of the first ordinances passed was a provision that trees could not be cut down without prior town approval (Town of Ross, 2007). Other civic improvements included the construction of five reinforced concrete bridges. These bridges were built by John Buck Leonard, a civil engineer and pioneer of reinforced concrete bridge construction. Today, they are the only remaining cluster of Leonard's work in the State of California (Ross Property Owners' Association, 2008). The Lagunitas Road Bridge is probably the most famous example of these bridges. In 1986, all five bridges were found eligible for nomination to the National Register of Historic Places (Jose Moya de Pino Library, et al., 2009, in USACE, 2010). Other Town of Ross landmarks from the early twentieth century include the Lagunitas Country Club, founded in 1903; the St. Anselmo Catholic Church, dedicated in 1908; St. John's Episcopal Church, constructed in 1911; Ross Grammar School, erected in 1911; and Ross Common, given to the Town of Ross in 1911 by Annie Ross Worn (Jose Moya de Pino Library, et al., 2009, in USACE, 2010). In the 1920s, the Town of Ross voted to spend $100,000 to purchase the Shotwell estate. Upon this land the town built the present Ross Town Hall and Fire Station in 1927 (Town of Ross, 2007).

With the completion of the Golden Gate Bridge in 1937, Marin County became more accessible, and the population of the Town of Ross began to increase. However, low-density development, environmental, and historical ordinances allowed the town to preserve most of its historic, rural characteristic. Today, the Town of Ross is still primarily a residential center comprised of landscaped streets and gardens, resting under a leafy canopy, and would not have been possible without the foresight and an environmental proclivity of the Town's founding leaders (Town of Ross, 2007).

Project Setting

According to the U.S. Army Corps of Engineers (USACE) 2018 consultation letter to the State Historic Preservation Officer (SHPO), the USACE has been active along this stretch of Corte Madera Creek since the 1960s (Beech, 2018), likely since modern channelization was first implemented. The USACE conducted record searches in 1978, 1998, 2003, and 2010. A pedestrian archaeological survey of the current project area was first conducted in 1978, and a survey of the built environment resources was completed in 1979 (Beech, 2018). Because details of these earlier studies are not available, information provided herein is limited to the USACE's most recent involvement with the project, as reported in their 2018 Draft EIS/EIR and the 2018 SHPO consultation letter.

Record Search

Two record searches have recently been conducted for the project by the Northwest Information Center (NWIC) of the California Historical Resources Information System at Sonoma State University. The USACE conducted a record search in January 2017 (NWIC File No.: 16-0601), and a second record search was conducted during July 2020 (NWIC File No.: 19-2242) for the

current project. The second record search requested new information since 2017 to augment the USACE's search; it was not an entirely new search of the project area.

The USACE record search identified two previously recorded resources within the project area and eight within a 500-foot search buffer, as measured from the centerline of the creek channel. The two in the project area include a bridge and a prehistoric site that was determined to consist of redeposited material through site investigations. Four of the eight resources within the 500-foot search buffer were Native American sites, and four were built environment resources. The 2020 record search did not identify any additional previously recorded resources within the project footprint, but one built environment resource had been recorded within the 500-foot search buffer. Resources identified by the record searches are listed in Table 3.4-2.

Table 3.4-2 NWIC Records Search Results – Resources

Resource Primary Number/Trinomial	Resource Name or Description	In Project APE/Buffer
USACE January 2017 Record Search (NWIC File No.: 16-0601)		
P-21-0101/CA-MRN-71	Prehistoric midden site	Buffer
P-21-0102/CA-MRN-72	Prehistoric midden site	Buffer
P-21-0294/CA-MRN-311	Prehistoric midden site	Buffer
P-21-0544/CA-MRN-406	Prehistoric midden site	Buffer
P-21-1327	Lagunitas Road Bridge over San Anselmo Creek*	APE
P-21-1329	Shady Lane Bridge over Ross Creek	Buffer
P-21-1330	Sir Francis Drake Boulevard Bridge over San Anselmo Creek	Buffer
P-21-1331	Winship Bridge over Corte Madera Creek	Buffer
P-21-2635	Ross Town Hall, Ross Fire House, and Ross Public Works building	Buffer
P-21-2794	Redeposited prehistoric midden material	APE
Horizon July 2020 Record Search (NWIC File No.: 19-2242)		
P-21-2918	Kentfield Fire Protection District Station No. 17	Buffer

[a] Although the record for the bridge identifies the creek crossing as San Anselmo Creek, the NWIC map clearly shows it as crossing Corte Madera Creek.

Sources: (NWIC, 2017; NWIC, 2020)

The USACE record search identified nine cultural resources studies within the USACE project area of potential effects, which aligned closely with the current project area. These included archaeological and architectural reports on earlier studies by the USACE of their Unit 4 project and other archaeological studies clustered around the College of Marin. Another 15 studies had

been conducted within the 500-foot record-search buffer. By July 2020, one additional archaeological study had been conducted within the project footprint. The search also identified four additional studies in the 500-foot search buffer and three regional overviews that include the project area. Studies conducted within the project area are listed in Table 3.4-3.

Table 3.4-3 NWIC Records Search Results – Studies in the APE

Report Number	Author (Date)	Report Title
USACE January 2017 Record Search (NWIC File No.: 16-0601)		
S-001025	T. L. Jackson (1976)	Archaeological Testing Program at the site of the proposed planetarium on the College of Marin Campus (letter report)
S-001184	E. Kandler (1978)	Cultural Resource Reconnaissance of the Corte Madera Creek Unit 4 Flood Control Project, Township of Ross, Marin County, California
S-006424	C. Desgrandchamp and D. Chavez (1984)	Archaeological Resources Evaluation for the Central Marin Sanitation Wastewater Transportation Facilities Improvement Project – Phase II, Marin County, California (EPA Project No. C-06-2467-21)
S-012944	R. Cartier, B. Bocek, and J. Whitlow (1979)	Archeological Testing Program of Corte Madera Creek Flood Control Project – Unit 4
S-015982	B. Goerke, et al. (1994)	Uncovering the Past at College of Marin
S-016949	W. Roop (1991)	A Cultural Resources Evaluation of a Proposed Reclaimed Water Pipeline in the San Quentin Point, Corte Madera, Larkspur, Kentfield and San Rafael Areas
S-036271	URS (2008)	Historic Property Survey Report, Lagunitas Road Bridge (27C-71) at Corte Madera Creek Replacement Project, BRLS 5176(003), Town of Ross, California
S-036937	B. Brewster (2010)	Archival Documentation Report, Dickson Hall – College of Marin
S-047475	L. D. Stables, III (1979)	Historical/Architectural Assessment of Buildings and Grounds Along Corte Madera Creek in Ross, California
Horizon July 2020 Record Search (NWIC File No.: 19-2242)		
S-050061	Archeo-Tec, Inc. (2017)	Phase I Cultural Resources Evaluation for the Ross Valley Sanitary District Large Diameter Gravity Sewer Rehabilitation Project II-3, Marin County, California

Sources: (NWIC, 2017; NWIC, 2020)

Archaeological Survey

According to the USACE 2018 Draft EIS/EIR (USACE 2018:4.7-9):

> A pedestrian survey was conducted of the study area on 5 and 6 April 2010[1] along both the east and west banks of Corte Madera Creek. For areas of possible ground disturbance, the inspection generally extended from either creek bank for 30 meters; however, heavy residential development, in some areas of the study area required a decreased inspection area. Vegetation cover was dense in most areas, with vines and grasses severely limiting ground visibility; in other areas, imported gravels on a bike path also limited ground visibility. Prehistoric artifacts, features, or middens were not observed during the pedestrian survey. Shell fragments were observed near the fence line adjacent to the College of Marin near site CA-MRN-406…

Horizon confirmed the area of survey coverage in a conversation on August 21, 2020, with Kathleen Ungvarsky, the USACE archaeologist who conducted the survey (Ungvarsky, 2020). Ms. Ungvarsky noted that the only areas that were inaccessible within the project footprint were two private properties just downstream of the Lagunitas RoadBridge, on the left side of Corte Madera Creek.

An archaeological survey was conducted of the current project area on July 28, 2020, by a qualified Horizon archaeologist who meets the U.S. Secretary of Interior's professional standards (Horizon Water and Environment, 2020). Because the entirety of the project area had previously been surveyed by the USACE (Beech, 2018; USACE, 2018) for the previous project, the present survey focused on the proposed locations of staging areas and the creekbanks in the backyards of 21, 23, 25, 27, and 29 Sir Francis Drake Boulevard, where widening of the channel and/or channel bank stabilization activities are proposed. The proposed location of the stormwater pump station and channel access ramp, as well as portions of the project near previously recorded archaeological sites, were also inspected. Most of the surveyed areas were limited in size, and informal transects were spaced between 10 and 30 feet apart. Ground-surface visibility was partially restricted in many places due to vegetation, and most of the staging areas were in paved parking lots. Representative photographs were taken of the project area as well as the houses at 21, 23, 25, 27, and 29 Sir Francis Drake Boulevard. No archaeological resources were identified by the field survey.

Geoarchaeology

No intact archaeological sites were identified in the archaeological inventory of the project area during earlier studies by the USACE (USACE, 2018) or more recently for the present project (Horizon Water and Environment, 2020); however, archaeological sites may be buried, with no

[1] A letter to the SHPO from K. Ungvarsky (2018) says that a survey was conducted in March 2015. Efforts to clarify this discrepancy with the USACE were unsuccessful.

surface manifestation. A review of geologic reconstructions of the subsurface geologic layers underlying the project area indicates that most of the area is underlain by Holocene Age soils that have the potential to contain buried archaeological remains (Witter, et al., 2006; Meyer & Rosenthal, 2007). However, sea levels rose dramatically during the Middle Holocene (ca. 7,000 to 4,000 B.P.), deeply burying any existing archaeological deposits from that time along the margins of the San Francisco Bay and upstream channels that flowed into the bay. This activity is applicable to the southwest extent of the APE, which was historically under bay waters (pre--1800s). However, more recently, landscape changes brought about by early Spanish settlement, as well as changes in upstream channel vegetation brought about by cattle raising and other activities, made many of these channels, such as Corte Madera Creek, much more susceptible to erosion. As a result, many of the lower terraces along the margins of the bay tend to contain historic-period sediments (Meyer & Rosenthal, 2007) that could have eroded and/or covered archaeological deposits. Moreover, rapid urban development along stream channels and areas along the bay margins have had further deleterious effects on buried deposits with the introduction of artificial fill and concrete channelization. These factors suggest that areas of the project area that fall within the former limits of the bay are not considered sensitive for buried archaeological deposits.

In addition, despite the higher potential to encounter Holocene Age deposits in the areas of the project area east of the former limits of the bay, the considerable channelization and alteration of the existing stream channel over the last 50 years—which includes massive concrete channels and stabilizing infrastructure along the banks of the creek—would indicate that any buried deposits within this corridor would likely have been destroyed. Further, the high-energy flood events along this corridor would also diminish the probability of intact deposits, particularly along the narrow band of the channel itself, which, in turn, would not have been a location favorable for long-term prehistoric settlement. Because the proposed actions are taking place within the footprint of the existing infrastructure or previously disturbed areas, the probability of encountering buried deposits in these areas is considered low.

Native American Consultation

An email request was made to the Native American Heritage Commission (NAHC) on June 15, 2020, to review its files for the presence of recorded sacred sites on the project area. The NAHC responded on June 16, 2020, stating that the records search did not identify significant resources in the project vicinity.

Marin County Department of Public Works sent project notification letters to the Federated Indians of Graton Rancheria (FIGR) and the Ione Band of Miwok Indians for the purpose of consultation as required by PRC Section 21080.3.1 (also known as Assembly Bill 52). The letters were sent via U.S. Certified Mail, with a return receipt sent on June 23, 2020. Follow-up emails were sent on August 5, 2020. FIGR requested formal consultation on the project in an emailed letter dated August 6, 2020. Requested record search information was provided to the tribe on August 21, 2020. Tribal consultation is discussed in Section 3.14 Tribal Cultural Resources.

Architectural Survey and Evaluation

The USACE Draft EIS/EIR identified five built environment resources adjacent to the project APE, as listed in Table 3.4-4, and described below. All the resource descriptions are taken directly from the USACE 2018 EIS/EIR.

Table 3.4-4 Built Environment Resources Identified by the USACE

Resource Primary Number	Resource Name or Description	Date of Construction	NRHP/CRHR Eligibility
P-21-1327	Lagunitas Road Bridge over San Anselmo Creek [a]	1909; reconstructed 2010	Eligible by consensus
P-21-1329	Shady Lane Bridge over Ross Creek	1909	Eligible by consensus
P-21-1330	Sir Francis Drake Boulevard Bridge over San Anselmo Creek	1909	Eligible by consensus
P-21-1331	Winship Bridge over Corte Madera Creek	1912	Not evaluated
P-21-2635	Ross Town Hall, Ross Fire House, and Ross Public Works building	1927	Eligible

Notes:

[a] Although the record for the bridge identifies the creek crossing as San Anselmo Creek, the NWIC map clearly shows it as crossing Corte Madera Creek.

[b] CRHR = California Register of Historical Resources

[c] NRHP = National Register of Historic Places.

Source: (USACE, 2018)

P-21-1327 is the Lagunitas Road Bridge, one of the first concrete bridges designed strictly on the cantilever principal, making possible a shallow depth in the carry girders. The bridge is carried by five haunched, continuous reinforced concrete T-beams on solid wall piers and end-diaphragm abutments. It has three spans, with a total length of 77.5 feet and width of 27.8 feet. It was one of five bridges built by the Town of Ross in 1909 and designed by John B. Leonard and is within the project area. The Lagunitas Road Bridge was reconstructed in 2010 and would not be altered by the project.

P-21-1329 is the Shady Lane Bridge over Ross Creek. It has a deck arch construction with a timber sidewalk added to the left side of the deck. The three spans create a 42.8-foot-long by 20-foot-wide roadway. This was the third of the five bridges built by the Town of Ross in 1909 and designed by John B. Leonard; this bridge is outside, but adjacent to, the project area.

P-21-1330 is the Sir Francis Drake Boulevard Bridge over San Anselmo Creek. It is a reinforced concrete deck arch span with a total length of 63 feet, with Toddlike rails of concrete. This was the second of the five bridges built by the Town of Ross in 1909 and designed by John B. Leonard. The site crosses Corte Madera Creek approximately 700 feet northwest of the project improvements, outside of the project area.

P-21-1331 is the Winship Bridge and carries Winship Road over Corte Madera Creek. It is an earth-filled, reinforced concrete bridge, 91 feet long, composed of two arches with spans of 40 feet and 28 feet. Rails are reinforced concrete planters. Four metal light standards at the corners are embossed with the Westinghouse logo. This was built after the five Leonard bridges in Ross. The Winship tract was a development being represented, in 1912, by Chadwick & Sykes, Contracting Engineers. At that time, they were trying to get the Town of Ross to accept their roadways as "public highways." The Winship Bridge no doubt dates from this general period. The site crosses Corte Madera Creek more than 1,000 feet north of proposed project improvements, outside of the project area.

P-21-2635 is the site of the Ross Town Hall, Ross Fire House, and Ross Public Works building. The Town Hall and Fire House were built in 1927 and designed by John White, one of the Bay Area's preeminent architects, after the city appropriated funds for the land. The Town Hall and Fire House were designed in the Spanish/Mission Revival style, with smooth stucco-faced exterior walls and appropriate design elements. The Town Hall and Fire House appear eligible for listing on the National Register of Historic Places (NRHP) under Criteria A and C for their association with city planning and municipal government and for their architecture. The Ross Town Hall and Firehouse are located near the northern end of the project area but are situated just outside of it, to the west.

In addition to the buildings evaluated by the USACE, five houses at 21, 23, 25, 27, and 29 Sir Francis Drake Boulevard were evaluated for NRHP/CRHR eligibility by a qualified architectural historian/historian (Horizon Water and Environment, 2020) The lots containing the homes are directly adjacent the transition element in Unit 4 of the project. As a result, the properties could be impacted by widening of the channel and/or channel bank stabilization actions. The five properties are listed in Table 3.4-5. None of these built environment resources appear to be eligible for listing in the NRHP/CRHR.

Table 3.4-5 Built Environment Resources Evaluated for the Current Project

Building Address	Date of Construction	NRHP/CRHR Eligibility
21 Sir Francis Drake Boulevard	c1951	Not eligible
23 Sir Francis Drake Boulevard	c1948	Not eligible
25 Sir Francis Drake Boulevard	c1951	Not eligible
27 Sir Francis Drake Boulevard	c1948	Not eligible
29 Sir Francis Drake Boulevard	c1948	Not eligible

Notes: CRHR = California Register of Historical Resources; NRHP = National Register of Historic Places

Source: (Horizon Water and Environment, 2020)

3.4.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project and are defined as standard conditions for the project.

Federal Regulations

National Historic Preservation Act of 1966 (as amended)

Effects of federal undertakings on historical and archaeological resources are considered through the National Historic Preservation Act (NHPA) of 1966, as amended (54 United States Code 306108), and its implementing regulations. Before an undertaking (e.g., federal funding or issuance of a federal permit) is implemented, Section 106 of the NHPA requires federal agencies to consider the effects of the undertaking on historic properties (i.e., properties listed in or eligible for listing in the National Register) and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for listing in the National Register. Under the NHPA, a property is considered significant if it meets the National Register listing criteria A through D, at 36 Code of Federal Regulations 60.4, as follows:

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that:
>
> 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.

For a resource to be eligible for the National Register, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. Resources that are less than 50 years old are generally not considered eligible for the National Register.

Federal review of the effects of undertakings on significant cultural resources is carried out under Section 106 of the NHPA and is often referred to as the Section 106 review. This process is the responsibility of the federal lead agency. The Section 106 review typically involves a four-step procedure, which is described in detail in the implementing regulations of the NHPA:

1. Define the Area of Potential Effects in which an undertaking could directly or indirectly affect historic properties.
2. Identify historic properties in consultation with the State Historic Preservation Officer (SHPO) and interested parties.

3. Assess the significance of effects of the undertaking on historic properties.
4. Consult with the SHPO, other agencies, and interested parties to develop an agreement that addresses the treatment of historic properties and notify the Advisory Council on Historic Preservation and proceed with the project according to the conditions of the agreement.

State Regulations

The State of California consults on implementation of the NHPA of 1966, as amended, and also oversees statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation, as an office of the California Department of Parks and Recreation, implements the policies of the NHPA statewide. The Office of Historic Preservation also maintains the California Historical Resources Inventory. The SHPO is an appointed official who implements historic preservation programs within the state's jurisdictions.

California Environmental Quality Act

The California Environmental Quality Act, as codified in PRC Section 21000 *et seq.*, is the principal statute governing the environmental review of projects in the state. CEQA requires lead agencies to determine if a project would have a significant effect on historical resources, including archaeological resources. The State CEQA Guidelines define a historical resource as: (1) a resource in the California Register; (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

CEQA requires lead agencies to determine if a project would have a significant effect on important archaeological resources, either historical resources or unique archaeological resources. If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC Section 21084.1 would apply, and State CEQA Guidelines Sections 15064.5(c) and 15126.4 and the limits in PRC Section 21083.2 would not apply. If a lead agency determines that an archaeological site is an historical resource, the provisions of PRC Section 21084.1 and State CEQA Guidelines Section 15064.5 would apply. If an archaeological site does not meet the State CEQA Guidelines criteria for a historical resource, then the site may meet the threshold of PRC Section 21083.2 regarding unique archaeological resources. A unique archaeological resource is:

> 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" (PRC Section 21083.2 [g]).

The State CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of the project on that resource shall not be considered a significant effect on the environment (CEQA Guidelines Section 15064.5[c][4]).

Assembly Bill 52
In September 2014, the California Legislature passed AB 52, which added provisions to the PRC regarding the evaluation of impacts on tribal cultural resources under CEQA and consultation requirements with California Native American tribes. In particular, AB 52 now requires lead agencies to analyze project impacts on tribal cultural resources separately from archaeological resources (PRC Sections 21074, 21083.09). The Bill defines tribal cultural resources in a new section of the PRC (Section 21074). AB 52 also requires lead agencies to engage in additional consultation procedures with respect to California Native American tribes (PRC Section 21080.3.1, 21080.3.2, 21082.3).

Specially, PRC Section 21084.3 states:

> a) Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.
>
> b) If the lead agency determines that a project may cause a substantial adverse change to a tribal cultural resource, and measures are not otherwise identified in the consultation process provided in Section 21080.3.2, the following are examples of mitigation measures that, if feasible, may be considered to avoid or minimize the significant adverse impacts:
>
> > 1) Avoidance and preservation of the resources in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
> >
> > 2) Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
> >
> > > A. Protecting the cultural character and integrity of the resource.
> > >
> > > B. Protecting the traditional use of the resource.
> > >
> > > C. Protecting the confidentiality of the resource.

3) Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

4) Protecting the resource.

In addition, the Office of Planning and Research updated Appendix G of the State CEQA Guidelines to provide sample questions regarding impacts on tribal cultural resources (PRC Section 21083.09).

California Register of Historical Resources

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

To be eligible for the California Register, an historical resource must be significant at the local, state, and/or federal level under one or more 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 (PRC Section 5024.1[c]).

For a resource to be eligible for the California Register, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. A resource that does not retain sufficient integrity to meet the National Register criteria may still be eligible for listing in the California Register.

California Public Resources Code and Health Safety Code

Several sections of the PRC protect cultural resources. Under PRC Section 5097.5, no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site (including fossilized footprints), inscriptions made by human agency, rock art, or any other archaeological, paleontological, or historical feature situated on public lands, except with the express permission of the public agency that has jurisdiction over the lands. Violation of this section is a misdemeanor. Section 5097.98 states that if Native American remains are identified within a project area, the lead agency must work with the appropriate Native Americans as identified by

the NAHC and develop a plan for the treatment or disposition of, with appropriate dignity, the human remains, and any items associated with Native American burials. These procedures are also addressed in Section 15064.5 of the State CEQA Guidelines. California Health and Safety Code Section 7050.5 prohibits disinterring, disturbing, or removing human remains from a location other than a dedicated cemetery. Section 30244 of the PRC requires reasonable mitigation for impacts on paleontological and archaeological resources that occur as a result of development on public lands.

Title 14, Sections 4307 and 4308, of the California Code of Regulations also prohibit any person from removing, inuring, defacing, or destroying any object of paleontological, archaeological, or historical interest or value.

Regional and Local Regulations

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan (Marin County, 2007, as amended) are relevant to the project (Marin County , 2007).

> ***HAR-1.1: Preserve Historical and Archaeological Resources.*** Identify archaeological and historical resource sites.
>
> ***HAR-1.2: Document Historical Information.*** Provide documents, photographs, and other historical information whenever possible to be catalogued in the Anne T. Kent California Room in the Marin County Free Library.
>
> ***HAR-1.3: Avoid Impacts to Historical and Archaeological Resources.*** Ensure that human activity avoids damaging cultural resources, where feasible.

Implementing programs associated with these policies ensures that significant cultural resources will be identified and protected, when feasible, and that Native American tribes will be consulted, when applicable.

Marin County Development Code

Marin County has the following code to ensure that the construction of new development and the establishment of new and modified uses contribute to the maintenance of a stable and healthy environment, that new development is harmonious in character with existing and future development, and that the use and enjoyment of neighboring properties are protected, as established in the Countywide Plan.

> ***22.20.040: Archaeological and Historic Resources***. In the event that archaeological or historic resources are discovered during any construction, construction activities shall cease, and the Agency shall be notified so that the extent and location of discovered materials may be recorded by a qualified archaeologist, and disposition of artifacts may occur in compliance with State and Federal law. The disturbance of an Indian midden may require the issuance of an Excavation Permit by the Department of Public Works, in compliance with Chapter 5.32 (Excavating Indian Middens) of the County Code.

Town of Ross General Plan

The following policies of the Ross General Plan related to cultural resources are applicable to the project (Town of Ross, 2007).

Goal 1. An Abundance of Green and Healthy Natural Systems

> **1.1 Protection of Environmental Resources**. Protect environmental resources, such as hillsides, ridgelines, creeks, drainage ways, trees and tree groves, threatened and endangered species habitat, riparian vegetation, cultural places, and other resources. These resources are unique in the planning area because of their scarcity, scientific value, aesthetic quality and cultural significance.

Goal 4. Protecting Historic Places and Resources

> **4.1 Historic Heritage**. Maintain the historic feel of Ross by preserving and maintaining historic buildings, resources and areas with recognized historic or aesthetic value that serve as significant reminders of the past.
>
> **4.5 Archaeological Resources**. Implement measures to preserve and protect archaeological resources. Whenever possible, identify archaeological resources and potential impacts on such resources. Provide information and direction to property owners in order to make them aware of these resources. Require archaeological surveys, conducted by an archaeologist who appears on the Northwest Information Center's list of archaeologists qualified to do historic preservation fieldwork in Marin County, in areas of documented archaeological sensitivity. Develop design review standards for projects that may potentially impact cultural resources.

3.4.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it 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 an archaeological resource pursuant to Section 15064.5; and
c. Disturb any human remains, including those interred outside of formal cemeteries.

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to changes in cultural resources or other cultural resource impacts in the project area. This section includes an analysis of potential short-term (construction) impacts of the project and permanent long-term (operation and maintenance impacts). Impact evaluations are assessed based on the

existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.4.6 Impact Discussion

Impacts Analyzed

	Significance Determination
Impact 3.4-1: The project would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.	**Construction: No Impact**
	Operation and Maintenance: No Impact

Construction

Background research has identified five built environment resources close to the project area as historical resources pursuant to PRC Section 15064.5; that is, they are eligible for listing in the CRHR. Background research and field studies identified four additional buildings within the project area, which were evaluated but do not appear to qualify as historical resources pursuant to PRC Section 15064.5. Because the known historical resources are outside of the project area, they would not be affected by the project. No archaeological resources that are historical resources are known to exist within the APE. The project would have no impact on any known historical resources pursuant to Section 15064.5.

Operation and Maintenance

Operations and maintenance of the proposed project would be similar to operation and maintenance of the existing flood control channel. No ground disturbance would be required in operation and maintenance other than sediment removal from the fish pools and erosion control. Operation and maintenance of the project would have no impact on historical resources because no historic resources pursuant to Section 15064.5 are located in proximity to the project and operation and maintenance project will not involve any ground disturbance.

Mitigation: None required.

	Significance Determination
Impact 3.4-2: The project could cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: No Impact

Construction

Based on the results of the background research and pedestrian survey, there are no intact archaeological resources in the project area. Despite the effort to identify archaeological resources, the inadvertent discovery of unknown archaeological resources during construction from ground-disturbing activities including excavation is possible. in the event that archaeological resources are uncovered during project-related ground disturbing activities within the unincorporated County area of the project, compliance with Marin Development Code Section 22.20.040 (D) (outlined above in Section 4.6.2.3 Local Regulations) is required.

Under Marin Development Code Section 22.20.040 (D), if archaeological materials are discovered during construction, construction activities shall cease, and the remains shall be recorded by a qualified archaeologist and treated according to state law. While the Marin Development Code provides some protection for archaeological resources within the unincorporated County area of the project, the code does not specify the distance at which work shall halt, and without proper investigation of the resource by an archaeologist and/or appropriate Native Americans, if appropriate, the resource could be damaged due to work in the vicinity of the find. The damage to a resource prior to proper investigation or improper handling of the resource would be a significant impact. In addition, portions of the project area below Stadium Way, where the project proposes floodplain expansion and partial concrete channel wall removal, are under the jurisdiction of the California State Lands Commission. As a result, treatment of discovered archaeological sites during construction would not be covered by Marin Development Code Section 22.20.040 (D), and impacts to archaeological resources within this portion of the project area would be significant.

The Town of Ross municipal code does not address the inadvertent discovery of archaeological resources during construction. Therefore, impacts to archaeological resources that are historical resources within portions of the project area under the Town's jurisdiction would be significant.

The District would implement **Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources** to avoid significant impacts on archaeological resources encountered during construction activities. Mitigation Measure 3.4-2 requires that work is halted within 50 feet of a find and that finds are protected until examined by a qualified archaeologist. The measure also defines requirements for contacting a Native American representative, and specific requirements for any discoveries of archaeological resources within the California State Lands Commission jurisdiction. By following the procedures in Mitigation Measure 3.4-2, the District would avoid substantial adverse changes in the significance of an archaeological resource and the impact on archaeological resources would be less than significant with mitigation.

Operation and Maintenance

Operations and maintenance of the proposed project would be similar to operation and maintenance of the existing flood control channel. Operation and maintenance does not involve excavation or ground disturbing activities that could encounter significant archaeological resources; therefore, operation and maintenance of the project would not have impacts to archaeological resources.

Mitigation: Implement Mitigation Measure 3.4-2.

Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources.

If evidence of any subsurface archaeological features or deposits are discovered during construction-related earth-moving activities, all ground-disturbing activity in the area of the discovery shall be halted within 50 feet of the find, and the finds shall be protected until they are examined by a qualified archaeologist. Prehistoric archaeological materials

might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; stone-milling equipment (e.g., mortars, pestles, handstones, milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include building or structure footings and walls and deposits of metal, glass, and/or ceramic refuse. The District shall retain a qualified archaeologist who meets the U.S. Secretary of the Interiors professional qualifications in archaeology to assess the significance of the find and make recommendations for further evaluation and treatment as necessary. A Native American representative from a traditionally and culturally affiliated tribe will be notified and invited to assess the find if the artifacts are of Native American ancestry and determined to be more than an isolated find. If the discovery is in an area below Stadium Way and on lands under the jurisdiction of California State Lands Commission, that agency shall be notified. Any treatments and disposition of any artifacts uncovered under the jurisdiction of the California State Lands Commission must be approved by the California State Lands Commission before the treatment is implemented.
If, after evaluation, a resource is considered a historical resource or unique archaeological resource (as defined in CEQA Guidelines Section 15064.5), or a tribal cultural resource (as defined in PRC Section 21074), all preservation options shall be considered as required by CEQA (see CEQA Guidelines Section 15126.4 and PRC 21084.3), including possible capping, data recovery, mapping, or avoidance of the resource. Treatment that preserves or restores the cultural character and integrity of a tribal cultural resource may include tribal monitoring, culturally appropriate recovery of cultural objects, and reburial of cultural objects or cultural soil. Work in the area may resume, at the direction of the District, upon completion of treatment. The results of the identification, evaluation, and/or data recovery program for any unanticipated discoveries shall be presented in a professional-quality report that details all methods and findings, evaluates the nature and significance of the resources, analyzes and interprets the results, and distributes this information to the public.

Significance after Mitigation: Mitigation Measure 3.4-2 specifies procedures to avoid adverse effects to archaeological resources by stopping work when archaeological materials are discovered, evaluating the significance of the find, and developing appropriate treatment to protect the site or mitigate impacts. By applying Section 15126.4 of the CEQA Guidelines and/or PRC 21084.3, avoidance and preservation in place would be the preferred option, followed by other measures such as capping and, lastly, data recovery, thus assuring that all options for minimizing impacts to the archaeological resource are considered and carried out. As a result, the impact on archaeological resources would be less than significant with mitigation.

	Significance Determination
Impact 3.4-3: The project could disturb any human remains, including those interred outside of formal cemeteries.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Construction

Both prehistoric and historic archaeological resources may contain human burials. Based on the background research, surface survey, and subsurface survey conducted during earlier studies by the USACE, there is no indication that the project area has been used for human burial purposes. The project includes excavation into undisturbed soils and could encounter human remains, including those interred outside of formal cemeteries. Compliance with Marin Development Code Section 22.20.040 (D), PRC Section 5097.98, and Health and Safety Code Section 7050.5 (outlined above in Section 4.6.2.3 Local Regulations) would require that work be stopped in the vicinity of any discovered human remains and that the County coroner be notified of the finds. The coroner would determine the nature of the remains and contact the NAHC if the remains are of Native American ancestry. In turn, the NAHC would contact the most likely descendent of remains, who would assess the finds and work with the County to determine final treatment and disposition of the remains. PRC Section 5097.98 and Health and Safety Code Section 7050.5 are also applicable to any discovery of human remains on property under the jurisdiction of the Town of Ross or the California State Lands Commission; therefore, the same protocols would be followed. Compliance with State and County requirements to address any discovery of human burials during construction would avoid disturbance of any human remains. The impact on human remains would be less than significant.

Operation and Maintenance

Operations and maintenance of the project would not require excavation into any undisturbed soils that could expose human remains. No impact would occur.

Mitigation: None required.

3.4.7 References

Basgall, et al., 2006. (in USACE, 2010). Corte Madera Creek Flood Control Study Baseline Report.

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3.5 Energy

3.5.1 Introduction

This section evaluates the potential impacts of the project on energy. This section also provides an overview of the environmental and regulatory settings that apply to energy and presents and discusses the potential project impacts to energy use and appropriate mitigation measures, as necessary.

3.5.2 Environmental Setting

Energy Supply

California's major sources of energy are petroleum products (i.e., gasoline, diesel, and oil), electricity, and natural gas. The California Energy Commission (CEC) indicates that California crude resources in 2019 came from in-state (29.7 percent), Alaska (11.9 percent), and foreign sources (58.4 percent) (CEC, 2020a). In 2018, California's in-state energy generation plus net imports totaled 285,675 gigawatt hours. Energy generation by source included hydroelectric (nine percent), nuclear (six percent), natural gas (32 percent), and renewable (17 percent) as well as coal and other imports (19 percent) (CEC, 2020b).

Energy Consumption

Existing land uses in the project vicinity consist of the Corte Madera Creek bed, trail and bike paths, public parks and open space, residential uses, and schools and colleges. No existing energy-emitting sources currently occur on the project site.

3.5.3 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

Federal Regulations

National Energy Conservation Policy Act

The National Energy Conservation Policy Act serves as the underlying authority for federal energy management goals and requirements. Signed into law in 1978, it has been regularly updated and amended by subsequent laws and regulations. This act is the foundation of most federal energy requirements.

National Energy Policy Act of 2005

The National Energy Policy Act of 2005 sets equipment energy efficiency standards and seeks to reduce reliance on non-renewable energy resources and provide incentives to reduce current demand on these resources. For example, under the Act, consumers and businesses can attain federal tax credits for purchasing fuel-efficient appliances and products, including hybrid vehicles; constructing energy-efficient buildings; and improving the energy efficiency of commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment.

Executive Order 13423 (Strengthening Federal Environmental, Energy, and Transportation Management), signed in 2007, strengthens the key energy management goals for the federal government and sets more challenging goals than the Energy Policy Act of 2005. The energy reduction and environmental performance requirements of Executive Order 13423 were expanded upon in Executive Order 13514 (Federal Leadership in Environmental, Energy, and Economic Performance), signed in 2009.

State Regulations

Low Carbon Fuel Standard Program

The Low Carbon Fuel Standard (LCFS) program was adopted by CARB in 2009 and began implementation on January 1, 2011. In 2018, CARB approved amendments to the regulation, which included strengthening and smoothing the carbon intensity benchmarks through 2030 in line with California's 2030 greenhouse gas (GHG) emission-reduction target enacted through SB 32, adding new crediting opportunities to promote zero-emission vehicle (ZEV) adoption, alternative jet fuel, carbon capture and sequestration, and advanced technologies to achieve deep decarbonization in the transportation sector. The LCFS is designed to encourage the use of cleaner low-carbon transportation fuels in California, encourage the production of those fuels, and, therefore, reduce GHG emissions and decrease petroleum dependence in the transportation sector (CARB, 2020).

Advanced Clean Cars Program

CARB adopted the Advanced Clean Cars (ACC) program in 2012. The ACC program coordinated regulations that apply to vehicle model years 2015 through 2025 to control smog, soot-causing pollutants, and GHG emissions. The three elements of the program are the ZEV regulations, GHG regulations, and particulate-matter standard. The ZEV program became a stand-alone regulation in 1999. Since then, the ZEV program has been reviewed and continually amended as technology and emission reduction needs have been identified. The current ZEV regulations require manufacturers to produce increasing numbers of fully electric vehicles and plug-in hybrid electric vehicles for model years 2018 through 2025. GHG regulations include furthering the Low-Emission Vehicle (LEV) Program. Some elements of the most recent LEV Program amendments include reducing emissions from light- and medium-duty on-road vehicles, an increase in useful life durability of these vehicles, and more stringent particulate-matter standards. Monitoring of the effectiveness of these programs to achieve the fuel--efficiency and emission goals will continue (CARB, 2020).

Regional and Local Regulations

Marin Countywide Plan

The following goals in the Marin Countywide Plan are relevant to the project (Marin County, 2007):

Energy Efficiency

Goal EN-1.1: Adopt Energy Efficiency Standards. Integrate energy efficiency and conservation requirements that exceed State standards into the development review and building permit process.

Goal EN-1.4: Reduce Energy Use in County Facilities. Continue to integrate energy efficiency and conservation into all County functions.

Goal EN-2.2: Adopt Renewable Energy Building Standards. Integrate technically and financially feasible renewable energy requirements into development and building standards.

Goal EN-3.1: Initiate Green Building Initiatives. Encourage and over time increasingly require sustainable-resource use and construction with non-toxic materials.

Goal EN-3.3: Incorporate Green Building in County Facilities. Integrate green building practices into all County facilities.

Town of Ross Municipal Code

The following code of the Town of Ross Municipal Code related to energy is applicable to the project (Town of Ross, 2020):

Chapter 15.10 California Energy Code

> **15.10.010 Adoption of the California Energy Code by reference.** The 2019 California Energy Code (California Code of Regulations, Title 24, Part 6), with Appendix 1-A, as published by the International Code Council, 500 New Jersey Avenue, NW, 6th Floor, Washington, D.C. 20001 and the California Building Standards Commission, 2525 Natomas Park Drive, Suite 130, Sacramento, California 95833-2936, is adopted by reference hereto. A copy of this document is maintained in the office of the Building Department. (Ord. 700 (part), 2019; Ord. 675 (part), 2016; Ord. 650 (part), 2013; Ord. 647 (part), 2013).

Town of Ross General Plan

The following policy of the Town of Ross General Plan related to energy is applicable to the project (Town of Ross, 2007):

Goal 2. Sustainable Building and Community Practices

> ***2.2 Incorporation of Resource Conservation Measures***. To the extent consistent with other design considerations, public and private projects should be designed to be efficient and innovative in their use of materials, site construction, and water irrigation standards for new landscaping to minimize resource consumption, including energy and water.

3.5.4 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines the project would have a significant impact on energy if it would:

a. Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to energy resources in the project area. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.5.5 Impact Discussion

Impacts Analyzed

	Significance Determination
Impact 3.5-1: The project would not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Construction

Implementation of the project would require the use of energy resources for construction of the project. Construction activities would be temporary and occur over a time period of seven months or less, during which time equipment and vehicles would be operating to construct the project. Energy use would primarily be in the form of petroleum products (i.e., gasoline and diesel) used to operate construction equipment and transport materials/supplies and workers to and from the project area. The precise amount of fuel required for project construction is uncertain; however, it is expected that gasoline and diesel for construction equipment and worker and haul vehicles would be comparable to quantities used for similar construction projects of similar size and magnitude, and that this consumption would not have a measurable effect on demand for local and regional energy sources. Fuel use for construction workers' commute trips would be minor in comparison to the fuel used by construction equipment and for hauling. Fuel consumption would be temporary and limited to the construction phase of the project. Construction would not require a large amount of energy, oil, or natural gas use due to

the short duration of construction and limited amount of equipment and associated fuel required. Indirect energy use would also occur and include the extraction, production, and transportation of goods and materials needed for construction. Section 2485 of the California Code of Regulations limits idling of heavy trucks traveling to and from the project area delivering and off-hauling materials, thereby limiting potential wasteful use of fuel during idling. Therefore, fuel used during construction would be conserved to the maximum extent feasible.

The demolition debris, including excavated soil and concrete, is anticipated to be recycled at the Marin Resource Recovery Center. In addition, rip-rap and excavated soil would be reused on site where feasible. Inefficient consumption of resources would be avoided through reuse of materials; therefore, project construction would have a less-than-significant impact on wasteful, inefficient, or unnecessary consumption of energy resources.

Operation and Maintenance

Implementation of the project would require the use of minimal energy resources for ongoing operation and maintenance activities, including vegetation management, sediment and debris removal, floodwall maintenance, and annual inspections. Energy use for annual inspections and maintenance activities for vegetation management, sediment removal, and floodwall maintenance would be similar to energy use for District inspection and maintenance of the existing concrete flood control channel because the project is not expected to increase the frequency or extent of operation and maintenance activities within the channel.

Operation of the new stormwater pump station equipment includes an electrical connection to the grid. The stormwater pump station would only require energy use during storm events when the pump station is needed to avoid flooding in the Granton Park neighborhood. A 150-kW generator powered by biodiesel would provide backup power to the pump station in the case of electrical failure. The amount of energy consumption resulting from operation of this equipment would be minimal because the equipment would only run during storm events and use of the equipment would be intermittent during operation. As a result, impacts associated with the wasteful, inefficient, or unnecessary consumption of energy resources would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.5-2: The project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

The project is a flood-risk reduction project that does to require a significant amount of energy use by its nature. The project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. The project would use low-carbon fuel equipment during construction and operation, in compliance with the LCFS. The project would comply

with the applicable ACC standards when employing vehicles and equipment during construction and operation of the project; therefore, impacts would be less than significant.

Mitigation: None required.

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3.6 Geology and Soils

3.6.1 Introduction

This section includes an evaluation of the potential for the project to result in adverse impacts related to geologic, seismic, and soils hazards. The analysis is based on review of available geologic and geotechnical reports and maps of the project area and vicinity, including site-specific investigations conducted for the project. This section also includes relevant regulations, a discussion of potential project impacts, and appropriate mitigation measures, where necessary.

3.6.2 Scoping Comments

Comments related to geologic and soils hazards were received during the public scoping process. These comments and the location where they are addressed in the geology and soils analysis are provided in Table 3.6-1.

Table 3.6-1 Geology and Soils Scoping Comments

Agency/Entity	Comment	Location in Geology and Soils Section that Comment is Addressed
Garril Page	Marin's Countywide Plan is a resource: maps and geological reports as well as data collected during annual creek maintenance and dredging should be part of this EIR.	The Geology, Mineral Resources and Hazardous Materials Technical Background Report for Marin Countywide Plan has been reviewed during preparation of the Draft EIR. Relevant information is incorporated into Section 3.6.3 Environmental Setting of this Section.
Garril Page	Adding 11 -17 new larger fish resting pools to the channel bottom has unknown effect on the existing concrete structure's stability and safety.	Section 3.6.6, Impact 3.6-3
Garril Page	The new larger fish resting pools in the channel bottom creates unknown effect on the existing concrete structure's stability, coefficient of roughness, profile at the time of any given flood event.	

3.6.3 Environmental Setting

Geology

Regional Geology

Marin County is located in the central portion of the Coast Ranges Geomorphic Province[1] (CGS, 2002). The Coast Ranges province extends about 600 miles along the western edge of California and is bounded on the south by the Transverse Ranges, on the north by the Klamath Mountains, and on the east by the Great Valley. This province is marked by northwest-trending elongated ranges and narrow valleys that roughly parallel the coast and the San Andreas Fault Zone (SAFZ). Much of the Coast Ranges province is composed of marine sedimentary deposits, metamorphic rocks, and volcanic rocks.

The SAFZ separates the Point Reyes Peninsula in western Marin County from the eastern portion of Marin County. The bedrock east of the SAFZ consists of Mesozoic rocks unconformably overlain by Tertiary (Miocene and younger) deposits. The Mesozoic rocks consist of the Great Valley complex and the Franciscan complex. The Great Valley complex consists of accreted and deformed remnants of Jurassic oceanic crust and a thick sequence of turbidites (disturbed deep ocean sediments). The Franciscan complex rocks were probably Jurassic oceanic crust and Jurassic to Cretaceous pelagic deposits (marine sediments) overlain by Upper Jurassic to Upper Cretaceous turbidites. During the Late Cretaceous time, the Franciscan complex was subducted beneath the Coast Ranges, which resulted in deformed and sheared rocks. During late Miocene time, the regional tectonic regime changed and became dominated by the transform boundary of the San Andreas Fault system and deposition of sediments on the older complexes (USACE, 2010). As a result of this geologic activity, the region is characterized by narrow valleys flanked by steep-sided, almost parallel ridges, trending northwest and approximately parallel to the Pacific Ocean coastline. Most ridges are below 5,000 feet and many are below 3,000 feet. The most prominent feature within the Corte Madera Creek watershed is Mount Tamalpais (2,604 feet) (USACE, 2010). The Corte Madera Creek watershed's western boundary is a steep, forested ridge. Numerous creeks that drain steep upland areas onto relatively steep and laterally confined alluvial valley flats combine as San Anselmo Creek in Ross Valley at San Anselmo. San Anselmo Creek then flows southeast through Ross Valley along the Cretaceous sandstone ridge running southeast along the eastern edge of the basin (Stetson Engineers Inc., 2000). San Anselmo Creek flows into Corte Madera Creek west of Greenbrae at the confluence with Ross Creek. Ross Valley can be loosely characterized as a long, narrow, alluvial-filled trench carved by Corte Madera Creek (USACE, 1966, in USACE 2010).

[1] A geomorphic province is a regional area that possesses similar bedrock, structure, history, and age. California has 11 geomorphic provinces.

Local Geology

The geologic units underlying the project area consist primarily of valley fill/alluvium. Artificial fill overlying bay mud occurs in the lower portion of Unit 2, and Franciscan Complex is located north of Lagunitas Road as shown on Figure 3.6-1. A geotechnical investigation conducted for Corte Madera Creek concrete channel from College of Marin to Kentfield Hospital (Units 3 and 2). The results of the geotechnical investigation indicate that the soils within Unit 2 beneath the concrete channel consists of an upper layer of sand, and beneath it are silty and clayey soils (GHD, 2019).

Franciscan Formation

Bedrock underlying the Corte Madera Creek drainage is part of the Jurassic-Cretaceous Franciscan Formation. The Franciscan formation in this area consists of hard sandstone (greywacke) with minor amounts of shale and chert and occasional serpentinite and greenstone. These rocks have been folded into a series of complex anticlines and synclines during the latest episode of crustal deformation during mid-Pleistocene time, and were subsequently or contemporaneously highly fractured and faulted. In general, the trend of these geologic structures is northwestward. Present physical and topographical expression in the Corte Madera Creek basin is aligned along and controlled by this trend (USACE, 1966, in USACE 2010).

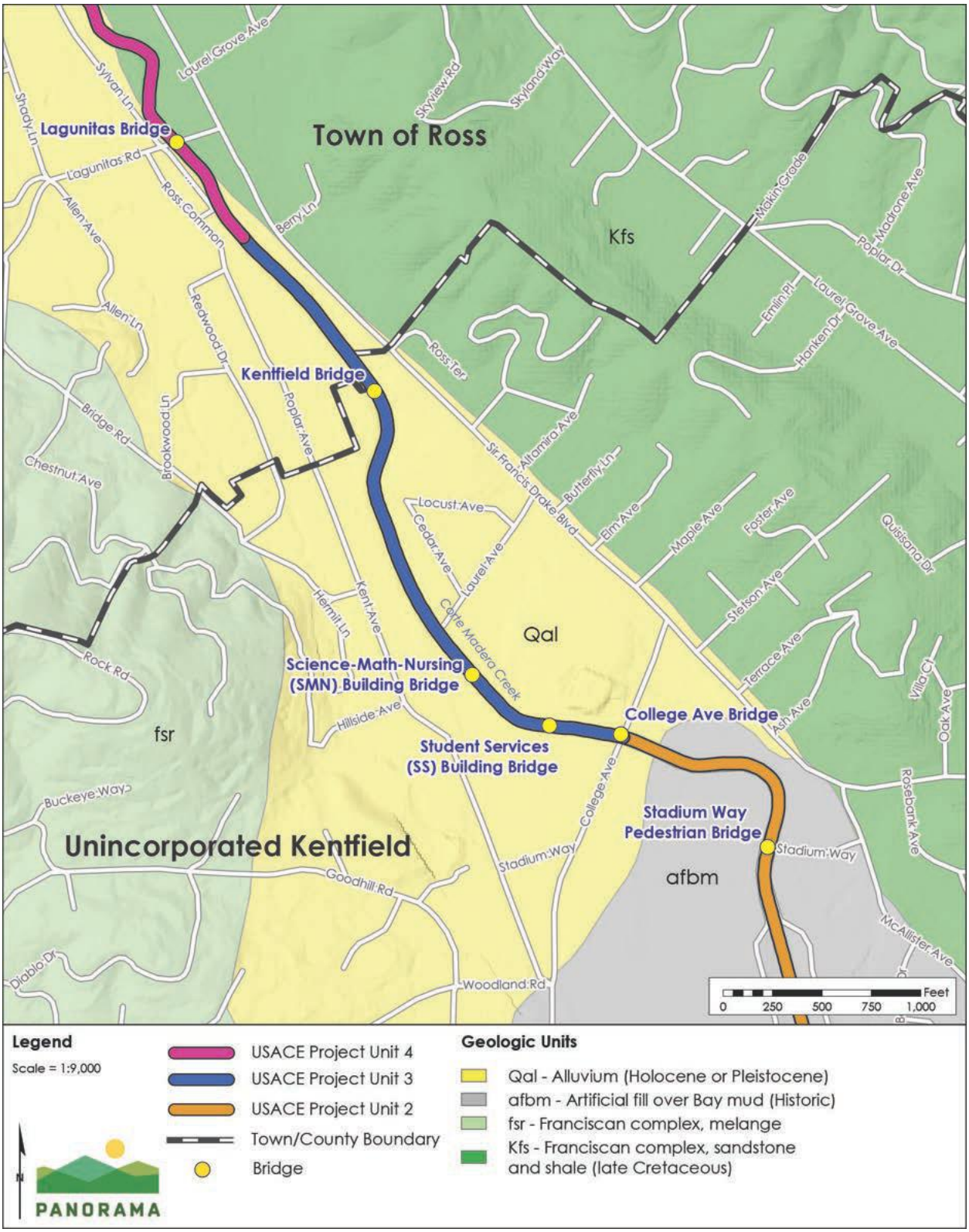
Near the upstream end of the project, at the Lagunitas Road Bridge, boring logs indicate the shallowest depth to bedrock is approximately 35 to 40 feet below ground surface (URS Corporation, 2009, in USACE 2010). The depth of bedrock is approximately 40 feet below ground surface near Kentfield and increases in depth towards the Bay (Stetson Engineers Inc., 2000). Sandstone bedrock has been reported 650 feet downstream of Stadium Way pedestrian bridge in Unit 2 at 63 feet below mean sea level (USACE, 1967, in USACE 2010).

Bay Mud

The watershed continues to experience ongoing tectonic uplift and faulting. Following the Pleistocene-Holocene transition (about 10,000 to 12,000 years ago), rising sea level and continuing tectonic uplift caused lower portions of eroding V-shaped upland valleys in Marin County watersheds to fill with sediment, creating u-shaped valleys (Stetson Engineers Inc., 2000). San Francisco Bay waters encroached upon and drowned the lower 2.5 miles of the ancestral Ross valley. The deposition of soft marine sediments formed the present-day tidal marshlands and mudflats (USACE, 1966, in USACE 2010). Holocene sea level rise probably influenced valley filling and flattened the valley slope in the alluvial channel network approximately below the City of San Anselmo (Stetson Engineers Inc., 2000).

The marine sediments are referred to as the "Buy Mud" formation, which attains a maximum thickness of approximately 125 feet in the center of Ross valley near U.S. Highway 101 (USACE, 2010). Bay Mud consists of silts and clays that are very soft to soft, wet, sticky, and structurally weak (USACE, 1966, in USACE 2010). The thickness of the Bay Mud ranges from 10 to 15 feet thick 850 feet downstream of Stadium Way pedestrian bridge and thins rapidly to 50 feet

Figure 3.6-1 Geologic Units



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, USGS 2009, US Geological Survey 2013)

downstream of Stadium Way pedestrian bridge. Upstream from Stadium Way pedestrian bridge, Bay Mud is reportedly absent and valley fill overlies bedrock. The geologic contact between Bay Mud and underlying valley fill materials is irregular and reflects the meandering nature of Corte Madera Creek in the past (USACE, 1967, in USACE 2010).

Valley Fill/Alluvium

Upstream of the marshland, the valley fill is composed of various mixtures of alluvial soils and slope-wash from the adjoining hills. The valley fill consists of interbedded sand and gravel, firm to stiff silt and clay, and lesser lenses of soft clay. The valley fill materials are generally stiff to dense and comparatively competent foundation materials (USACE, 1966, in USACE 2010; USACE, 1967, in USACE 2010).

Faults and Seismicity

This section characterizes the region's existing faults, describes historical earthquakes, estimates the likelihood of future earthquakes, and describes probable groundshaking effects.

Earthquake Terminology and Concepts

Earthquake Mechanisms and Fault Activity

Faults are planar features within the earth's crust that have formed to release strain caused by the dynamic movements of the earth's major tectonic plates. An earthquake on a fault is produced when these strains overcome the inherent strength of the earth's crust, and the rock ruptures. The rupture causes seismic waves that propagate through the earth's crust, producing the groundshaking effect known as an earthquake. The rupture also causes variable amounts of slip along the fault, which may cause displacement at the earth's surface.

Geologists commonly use the age of offset rocks as evidence of fault activity—the younger the displaced rocks, the more recently earthquakes have occurred. To evaluate the likelihood that a fault would produce an earthquake, geologists examine the magnitude and frequency of recorded earthquakes and evidence of past displacement along a fault. The California Geological Survey (CGS) defines an active fault as one that has had surface displacement within Holocene time (within the last 11,000 years; the U.S. Geological Survey (USGS) uses within the last 15,000 years). A Quaternary fault is defined as a fault that has shown evidence of surface displacement during the Quaternary period (the last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not mean that a fault lacking evidence of surface displacement is necessarily inactive. The term "sufficiently active" is also used to describe a fault if there is some evidence that Holocene displacement has occurred on one or more of its segments or branches (CGS, 2018).

For the purpose of delineating fault rupture zones, the CGS historically sought to zone faults defined as potentially active, which are faults that have shown evidence of surface displacement during the Quaternary period. In late 1975, the State Geologist made a policy decision to zone only those faults that had a relatively high potential for ground rupture, determining that a fault should be considered for zoning only if it was sufficiently active and "well defined." Blind faults are faults that do not show surface evidence of past displacement, even if they occurred in

the recent past. Faults that are confined to pre-Quaternary rocks are considered inactive and incapable of generating an earthquake.

Earthquake Magnitude

When an earthquake occurs along a fault, its size can be determined by measuring the energy released during the event. A network of seismographs records the amplitude and frequency of the seismic waves that an earthquake generates. The Richter magnitude (M_L) of an earthquake represents the highest amplitude measured by the seismograph at a distance of 100 kilometers from the epicenter. Richter magnitudes vary logarithmically with each whole-number step, representing a tenfold increase in the amplitude of the recorded seismic waves and 32 times the amount of energy released. While Richter magnitude was historically the primary measure of earthquake magnitude, seismologists now use Moment Magnitude (Mw) as the preferred way to express the size of an earthquake. The Mw scale is related to the physical characteristics of a fault, including the rigidity of the rock, the size of fault rupture, and the style of movement or displacement across the fault. Although the formulae of the scales are different, they both contain a similar continuum of magnitude values, except that Mw can reliably measure larger earthquakes and do so from greater distances.

Peak Ground Acceleration

A common measure of ground motion at any particular site during an earthquake is the peak ground acceleration (PGA). The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g), which is approximately 980 centimeters per second squared. In terms of automobile acceleration, one "g" of acceleration is equivalent to the motion of a car traveling 328 feet from rest in 4.5 seconds. For comparison purposes, the maximum peak acceleration value recorded during the Loma Prieta earthquake was in the vicinity of the epicenter, near Santa Cruz, at 0.64 g. Unlike measures of magnitude, which provide a single measure of earthquake energy, PGA varies from place to place and is dependent on the distance from the epicenter and the character of the underlying geology (e.g., hard bedrock, soft sediments, or artificial fills).

Faults and Probable Earthquake Activity

The project area is in a seismically active region of California. The San Francisco Bay Area contains both active (Holocene age, or within the last 11,000 years) and potentially active (Quaternary age, or within the last 1.6 million years) faults and there is the potential for damage resulting from movement along any one of a number of the active faults throughout the area. The Working Group on California Earthquake Probabilities concluded there is a 72 percent probability of at least one magnitude 6.7 or greater earthquake before 2044 within the San Francisco Bay area (USGS, 2015). This earthquake is likely to occur on one of the seven major fault systems in the bay area. It was determined that the Hayward-Rodgers Creek, San Andreas and Calaveras fault systems have the highest probabilities of generating a magnitude 6.7 or greater earthquake before 2044. The Northern San Andreas (6.4 percent probability) and the Hayward-Rodgers Creek (14.3 percent probability) fault systems could have the greatest impacts on Marin County because of their proximity to population centers

within Marin County and the fact that they have the highest probability of rupture in the San Francisco Bay Region. There is also a 98 percent probability for a magnitude 6.0 or greater earthquake before 2044 in the San Francisco Bay region (USGS, 2015).

The project area is approximately 9 miles equidistant between the San Andreas and Hayward-Rodgers Creek Faults Zone, discussed below. The locations of these faults and their geographic relationship to the project area are shown in Figure 3.6-2.

San Andreas Fault Zone

The San Andreas Fault Zone is a major structural feature in the region and forms a boundary between the North American and Pacific tectonic plates (USGS, 2002) . The San Andreas Fault is a major northwest-trending, right-lateral, strike-slip fault that extends for about 600 miles from the Gulf of California in the south to Cape Mendocino in the north. The San Andreas is not a single fault trace but rather a system of active faults that diverges from the main fault south of the City of San Jose, California. The San Andreas Fault has produced numerous large earthquakes, including the 1906 San Francisco earthquake. That event had an estimated M_L 8.3 or Mw 7.8 (WGCEP, 2008) and was associated with up to 21 feet of displacement and widespread ground failure (Lawson, 1908). The project area is about 9 miles from the San Andreas Fault Zone. The San Andreas Fault Zone has a 6.4 percent probability of generating an earthquake with a magnitude equal to or greater than 6.7 Mw before 2044 (USGS, 2015).

Hayward-Rodgers Creek Fault Zone

The Hayward-Rodgers Creek Fault Zone is approximately 118 miles in length, located mostly along the base of the hills along the east side of San Francisco Bay and running parallel to the San Andreas Fault Zone. Similar to the San Andreas, it is composed of a system of active faults. The Hayward-Rogers Creek Fault has also produced numerous large earthquakes, including the 1868 earthquake with an estimated magnitude of about 7.0. The project area is about 10 miles from the Hayward-Rodgers Creek Fault Zone. The Hayward-Rodgers Creek Fault has a 14.3 percent probability of generating an earthquake with a magnitude equal to or greater than 6.7 Mw before 2044 (USGS, 2015).

The project area is not within an Alquist-Priolo Earthquake Fault Zone, and the area is not near any known active faults (USACE, 2010). Although no faults cross the project area, other faults in the region capable of producing earthquakes that could affect the project area include the Calaveras, San Gregorio, Concord-Green Valley, Greenville, and Mount Diablo faults (Marin County, 2005).

Geologic Hazards

Seismic Conditions

The San Andreas and Hayward faults are designated by the California Seismic Hazard Map with Maximum Credible Earthquake (MCE) magnitudes of 8.0 and 7.5, respectively. The California Seismic Hazard Maps for the region indicates that the closest mapped fault to the project area is the San Andreas Fault. The project area is in an area subject to severe to violent perceived ground shaking and expected damage to structures is moderate heavy to heavy from

a San Andreas Fault earthquake; and very strong to severe perceived ground shaking and expected damage to structures is moderate to moderate heavy from a North Hayward-Rogers Creek Fault earthquake (Marin County, 2005).

Liquefaction, Settlement, and Lateral Spreading

Strong ground shaking caused by large earthquakes can induce ground displacement and/or failure such as liquefaction, compaction settlement, and slope movement. A site's susceptibility to these hazards relates to the site topography, soil conditions, and depth to groundwater. In general, a relatively high potential for liquefaction exists in loose, sandy soils that are within 50 feet of the ground surface and are saturated (below the groundwater table). Liquefaction can result in loss of foundation support and settlement of overlying structures, ground subsidence and translation due to lateral spreading, and differential settlement of affected deposits. Lateral spreading occurs when a soil layer liquefies at depth and causes horizontal movement or displacement of the overburden mass on sloping ground or toward a free face such as a stream bank or excavation, or toward an open body of water. Settlement can occur as a result of the relatively rapid rearrangement, compaction, and settling of subsurface materials, particularly loose, uncompacted, and variable sandy sediments. Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Areas are susceptible to differential settlement if underlain by compressible sediments, such as poorly engineered artificial fill. The liquefaction susceptibility in the project area ranges from moderate to very high (USGS, 2006). The soil types underlying the project area include Tocaloma-McMullin-Urban Land Complex and Xerorthents-Urban land complex (USDA, 2020). These soils have a depth to water table of more than 80 inches (USDA, 2020). The project area is likely to be subject to liquefaction and lateral spreading during large seismic events due to the high groundwater levels and alluvial deposits (consists of loose and unconsolidated silt, sand, clay, and gravel) onsite (USACE, 2018a).

Landslides

Typically, landslides and other slope stability hazards are activated in response to an increase in subsurface and surficial water content, earthquake shaking, the addition of load on a slope, or the removal of downslope support. The project area lies upon relatively flat ground, with the exception of the west and east headwalls on the banks of Corte Madera Creek. Landslide hazards are likely limited to potential slope instability. Excess sediment supply resulting from the February 2017 storms triggered numerous landslides in Unit 4 and creek bank slides appear to be continuing to work through the system (geomorphDESIGN, 2019). Bank instability or localized sloughing has also been reported by residents in Unit 4; however, these are small scale events resulting from the incised channel, instability from development along the creek, and the flashiness of the watershed (USACE, 2018b).

Figure 3.6-2 Faults in the Local Region



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, U.S. Geological Survey and California Geological Survey 2010, US Geological Survey 2013)

Paleontological Resources

Paleontological resources are the fossilized remains or impressions of plants and animals, including vertebrates (animals with backbones; mammals, birds, fish, etc.), invertebrates (animals without backbones; starfish, clams, coral, etc.), and microscopic plants and animals (microfossils). Paleontological resources are nonrenewable, scientific resources that may be valuable in documenting the existence of extinct life forms and reconstructing the environments in which they lived. Fossils can be used to determine the relative ages of the depositional layers in which they occur and of the geologic events that created those deposits. The age, abundance, and distribution of fossils depend on the geologic formation in which they occur and the topography of the area in which they are exposed. The geologic environments within which the plants or animals became fossilized usually were quite different from the present environments in which the geologic formations now exist.

The Society of Vertebrate Paleontology published Standard Guidelines in response to a recognized need to establish procedures for the investigation, collection, preservation, and cataloguing of fossil bearing sites (SVP, 2010). The Standard Guidelines are widely accepted among paleontologists, followed by most investigators, and identify the two key phases of paleontological resource protection: (1) assessment and (2) mitigation. Assessment involves identifying the potential for a project site or area to contain significant nonrenewable paleontological resources that could be damaged or destroyed by project excavation or construction. Mitigation involves formulating and applying measures to reduce such adverse effects, including pre-project survey and salvage, monitoring and screen washing during excavation to salvage fossils, conservation and inventory, and final reports and specimen curation. The Society of Vertebrate Paleontology defines the level of potential as one of four sensitivity categories for sedimentary rocks: high, undetermined, low, and no potential as listed below.

1. **High Potential** – 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. Rocks 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, etc.). 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.

2. **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 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.
3. **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 (i.e., Holocene) colluvium. Rock units with low potential typically will not require impact mitigation measures to protect fossils.
4. **No Potential** – This designation is assigned to geologic formations that are entirely plutonic (volcanic rocks formed beneath the earth's surface) in origin and therefore have no potential for producing fossil remains.

In the context of CEQA, fossils of land dwelling and marine vertebrates, their environment, and associated geological, stratigraphical, taphonomical, and geographical data are considered important (i.e., significant) paleontological resources. Such fossils typically are found in river, lake, and bog deposits, although they may occur in nearly any type of sedimentary sequence.

A search of the University of California Museum of Paleontology collections database indicated one invertebrate fossil has been recovered from the Franciscan Formation (bedrock) in Corte Madera (UCMP, 2020).

Late Pleistocene and Holocene fossils have been recovered from marine sediments (Bay Mud) elsewhere in the San Francisco Bay area. For example, near the Bay Bridge San Francisco anchorage, remains of petrified wood, marine mollusks and mammals, bony fishes, amphibians, reptiles, birds, a diversity of extinct land mammals such as ground sloths, mammoth, mastodon, deer, horse, camel, and bison, and microfossils such as radiolaria, foraminifera, diatoms, pollen, and spores have been found in older Bay Mud. Fossil mollusk shells were reported in cores of Holocene younger Bay Mud from depths of approximately 20 and 25 feet near Candlestick Point in San Francisco (City and County of San Francisco , 2009).

Upstream from Stadium Way pedestrian bridge, Bay Mud is reportedly absent and valley fill overlies bedrock (refer to Figure 3.6-1). In the vicinity of the Lagunitas Road

Bridge within the upper reach of Unit 4, the sandy, lean clay and sandy gravel have no to low potential to contain unique paleontological resources (Town of Ross, n.d., in USACE 2010).Typical valley fill/alluvium in the project area consists of mixtures of alluvial soils and slope wash from the adjoining hills.

Unique Geologic Features

A unique geologic feature embodies distinctive characteristics of any regional or local geologic principles, provides a key piece of information important to geologic history, contains minerals not known to occur elsewhere in the county, and/or is used as a teaching tool. No unique geologic features were identified near or within the project area.

3.6.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project and are defined as standard conditions for the project.

Federal Regulations

Although there are a number of federal laws, statutes, and regulations that would generally apply to the project, the federal government and its agencies have delegated the authority to implement and satisfy those requirements relevant to geology, seismicity, and soils to the state of California and its agencies, as discussed below.

State Regulations

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to protect structures for human occupancy from the hazard of surface faulting. In accordance with the Alquist-Priolo Earthquake Fault Zoning Act, the State Geologist has established regulatory zones—called earthquake fault zones—around the surface traces of active faults and has published maps showing these zones.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. This Act requires the State Geologist to delineate various seismic hazard zones, and cities, counties, and other local permitting agencies to regulate certain development projects within these zones (CGS, 2019). The CGS is in the process of producing official maps based on USGS topographic quadrangles.

California Building Code

The California Building Code (CBC), which is codified in Title 24 of the California Code of Regulations, Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards related to structural strength, means of egress to facilities (entering and exiting), and general stability of buildings. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction. Title 24 is administered by

the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under State law, all building standards must be centralized in Title 24 or they are not enforceable. The provisions of the CBC apply to the construction, alteration, movement, replacement, location, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The 2016 edition of the CBC is based on the 2015 International Building Code published by the International Code Council, which replaced the Uniform Building Code. The code is updated triennially, and the 2016 edition of the CBC was published by the California Building Standards Commission on July 1, 2016, and took effect starting January 1, 2017. The 2016 CBC contains Appendix J Grading, which has been adopted by the County of Marin and includes the following provisions.

Section J101.2 requires that work in flood hazard area requires the preparation of an engineering analysis prepared by a registered design professional that demonstrates the work will not result in any increase in the level of the base flood.

Section J104.3 requires the preparation of a geotechnical report prepared by a registered design professional that shall describe the nature and distribution of existing soils; conclusions and recommendations for grading procedures; soil design criteria for any structures or embankments required to accomplish the proposed grading; and slope stability studies, where necessary.

Section J110.1 requires the faces of cut and fill slopes shall be prepared and maintained to control erosion. The control shall be permitted to consist of effective planting.

National Pollutant Discharge Elimination System Construction General Permit
Projects that disturb more than one acre of land during construction are required to comply with the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Order 2009-0009-DWQ, NPDES No. CAS000002; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ). The Construction General Permit regulates discharges of pollutants in stormwater associated with construction activity to waters of the U.S. from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface. In the project area, the Construction General Permit is implemented and enforced by the San Francisco Bay Regional Water Quality Control Board, which administers the stormwater permitting program. The permit regulates stormwater discharges associated with construction or demolition activities, such as clearing and excavation; construction of buildings; and linear underground projects, including installation of water pipelines and other utility lines.

The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes specific construction best management practices (BMPs) designed to prevent sediment and pollutants from contacting stormwater from moving offsite into receiving waters. The BMPs fall into several categories,

including erosion control, sediment control, waste management and good housekeeping, and are intended to protect surface water quality by preventing the off-site migration of eroded soil and construction-related pollutants from the construction area. Routine inspection of all BMPs is required under the provisions of the Construction General Permit. The SWPPP must be prepared before the construction begins. The SWPPP must contain a site map(s) that delineates the construction work area, existing and proposed buildings, parcel boundaries, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project area. In addition, the SWPPP is required to contain a visual monitoring program, a chemical monitoring program for non-visible pollutants, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. Corte Madera Creek is not listed on the 303(d) list for sediment.[2]

Regional and Local Regulations

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan are relevant to the project (Marin County , 2007).

Water Resources

Goal WR-1: Healthy Watersheds. Achieve and maintain proper ecological functioning of watersheds, including sediment transport, groundwater recharge and filtration, biological processes, and natural flood mitigation, while ensuring high-quality water.

> ***Policy WR-1.3: Improve Infiltration.*** Enhance water infiltration throughout watersheds to decrease accelerated runoff rates and enhance groundwater recharge. Whenever possible, maintain or increase a site's predevelopment infiltration to reduce downstream erosion and flooding.
>
> > *Implementing Program: WR-1.b Establish Development Standards for Infiltration.* Establish qualitative standards to maximize groundwater infiltration and minimize surface water runoff based on criteria developed by the Bay Area Stormwater Management Agency Associates. Standards should regulate the amount of impervious surfaces; vary by project type, land use, building-site placement, soils, and area characteristics; and provide for water impoundments, protecting and planting vegetation, cisterns, and other measures, such as restricting wet weather grading to increase groundwater recharge and reduce sedimentation.
> >
> > *Implementing Program: WR-1.f Require Stream Restoration Projects.* Require restoration of streams in conjunction with associated land use approvals to

[2] Corte Madera Creek is currently being addressed for diazinon with a U.S. Environmental Agency approved Total Maximum Daily Load (Regional Water Board, 2017).

improve groundwater recharge and filtration and to ensure high-quality water. Restoration projects should follow the design principles of natural channel restoration utilizing geomorphic concepts.

Goal WR-2: Clean Water. Ensure that surface and groundwater supplies are sufficiently unpolluted to support local natural communities, the health of the human population, and the viability of agriculture and other commercial uses.

Policy WR-2.3: Avoid Erosion and Sedimentation. Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and on-site sediment retention. Require developments to include on-site facilities for the retention of sediments, and, if necessary, require continued monitoring and maintenance of these facilities upon project completion.

Implementing Program: WR-2.b Integrate Bay Area Stormwater Management Agencies Association Stormwater Quality Protection Guidelines into Permitting Requirements for All Development and Construction Activities. All projects should integrate stormwater pollution prevention design features for water quality protection to the extent feasible, such as those included in the Bay Area Stormwater Management Agencies Association Start-at-the-Source manual and the Tools Handbook.

The above-listed goals, policies, and implementing programs are implemented in the Marin County Stormwater Pollution Prevention Program, discussed further below.

Environmental Hazards

Goal EH-2: Safety from Seismic and Geologic Hazards. Protect people and property from risks associated with seismic activity and geologic conditions.

Policy EH-2.1 Avoid Hazard Areas. Require development to avoid or minimize potential hazards from earthquakes and unstable ground conditions.

Implementing Program: EH-2.a Require Geotechnical Reports. Continue to require any applicant for land division, master plan, development approval, or new construction in a geologic hazard area to submit a geotechnical report prepared by a State-certified Engineering Geologist or a Registered Geotechnical Engineer that:

a. evaluates soil, slope, and other geologic hazard conditions;
b. commits to appropriate and comprehensive mitigation measures sufficient to reduce risks to acceptable levels, including post-construction site monitoring, if applicable;
c. addresses the impact of the project on adjacent lands, and potential impacts of off-site conditions; and

d. meets the requirements of other agency regulations with jurisdiction in the hazard area, such as Bay Conservation and Development Commission requirements for the safety of fills consistent with the Bay Plan.

Implementing Program: EH-2.b Require Construction Observation and Certification. Require any work or construction undertaken to correct slope instability or mitigate other geologic hazard conditions to be supervised and certified by a geotechnical engineer and/or an engineering geologist.

Marin County Municipal Code

The following code of Marin County Municipal Code is relevant to the project (Marin County , 2020).

Chapter 22.16 Discretionary Development Standards

22.16.030 General Standards.

J. Site preparation.

5. Geologic hazards. Construction shall not be permitted on identified seismic or geologic hazard areas such as on slide, on natural springs, on identified fault zones, or on bay mud without approval from the Department of Public Works, based on acceptable soils and geologic reports.

Town of Ross General Plan

The following policies of the Ross General Plan related to geology and soils are applicable to the project (Town of Ross, 2007).

Goal 5. Protecting Community Health and Safety, and Preparing for Emergencies

5.2 Geologic Review Procedures. At the time a development is proposed, Ross geologic and slope stability maps should be reviewed to assess potential geologic hazards. In addition, suitability for development must be based on site-specific geotechnical investigations.

Town of Ross Municipal Code

The following codes of the Town of Ross Municipal Code related to geology and soils are applicable to the project (Town of Ross, 2020).

Chapter 12.28 Urban Runoff Pollution Prevention

12.28.090 Reduction of Pollutants in Urban Runoff. (1) Best Management Practices for Construction, New Development, and Redevelopment.

(A) Any person performing construction, development or redevelopment activities in the town that require a permit or approval under the Ross Municipal Code, including but not limited to approvals under Titles 15, 17 and 18, shall implement appropriate BMPs to prevent the discharge of construction wastes or

contaminants from construction materials, tools and equipment from entering a town storm drain or watercourse.

(B) Construction-phase BMPs include erosion and sediment controls and pollution prevention practices. Erosion control BMPs may include, but are not limited to, scheduling and timing of grading activities, timely revegetation of graded areas, the use of hydroseed and hydraulic mulches, and installation of erosion control blankets. Sediment control may include properly sized detention basins, dams, or filters to reduce entry of suspended sediment into the storm drain system and watercourses, and installation of construction entrances to prevent tracking of sediment onto adjacent streets. Pollution prevention practices may include designated washout areas or facilities, control of trash and recycled materials, tarping of materials stored on-site, and proper location of and maintenance of temporary sanitary facilities. The combination of BMPs used, and their execution in the field, must be customized to the site using up-to-date standards and practices. The agency will provide references to current guidance manuals and BMP information on request.

3.6.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project could have a significant impact if it would:

a. Directly or indirectly cause potential substantial adverse effects, including the risk or loss, injury, or death involving:
   i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. Refer to Division of Mines and Geology Special Publication 42.
   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 Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Approach to Impact Analysis

The following analysis discusses the potentially significant impacts of the project related to changes in geology and soils. The impact evaluation is based on the potential for the project to change geologic and soil conditions or expose facilities or people to unstable geologic conditions during project activities, using existing site conditions as a baseline for comparison. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section.

3.6.6 Impact Discussion

Impacts Avoided

Due to the nature of the project, there would be no impacts related to the following criterion; therefore, no impact discussion is provided for the reasons described below:

1. **Criterion (e):** Implementation of the project would not involve installation of septic tanks or alternative wastewater disposal systems. No impacts would occur.

Impact Analyzed

Impact 3.6-1: The project could directly or indirectly cause potential substantial adverse effects, including the risk or loss, injury, or death involving: **i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. Refer to Division of Mines and Geology Special Publication 42.** **ii. Strong seismic ground shaking.** **iii. Seismic-related ground failure, including liquefaction.** **iv. Landslides.**	**Significance Determination**
	Construction: Less than Significant
	Operation and Maintenance: Less than Significant with Mitigation

Rupture of a Known Earthquake Fault

The project area is not located within an earthquake fault zone as defined by the Alquist-Priolo Earthquake Fault Zoning Act, and no active or potentially active faults exist on or in the immediate vicinity of the site. Although fault rupture could occur on unknown faults, fault rupture is not expected in the project area. Project construction would only last seven months and would not introduce a substantial number of people to the area. Operation and maintenance of the project would not introduce additional people or structures to the area that

would increase the risk of loss, injury or death in the unlikely event of fault rupture. The concrete channel removal in Frederick Allen Park and lower Unit 2 would reduce the risk of structural failure from fault rupture because the earthen channel would be less susceptible to failure than the concrete channel. The new segments of floodwalls in Units 2 and 3 would be located along the existing floodwalls and would be generally 2 to 4 feet tall. The new segments of floodwall would not increase the risk of loss, injury, or death from fault rupture. The impact would be less than significant.

Seismic Ground Shaking

The project is not within a designated seismic hazard zone and is not subject to the Seismic Hazards Mapping Act. The nearest fault to the project site is the San Andreas Fault, which is located approximately 9 miles to the west of the project area. The Hayward Fault is approximately 10 miles east of the project area and the Rodgers Creek Fault is approximately 15 miles northeast of the project area. Ground shaking is the primary cause of earthquake damage to man-made structures, strong ground shaking could cause shearing, differential settlement, or heave of structures, causing damage to buildings and structures. The project is located in an area of high seismicity where severe to violent ground shaking could result from a large earthquake on the San Andreas Fault Zone and very strong to severe ground shaking could result from earthquakes on either the North Hayward or Rodgers Creek Faults.

Construction

In the event of an earthquake, construction workers could be exposed to hazards from strong seismic ground shaking. Project construction would not substantially increase these risks of exposure over typical risks of exposure throughout the region. Earthquake safety training pursuant to Occupational Safety and Health Administration (OSHA) regulations would minimize potential for impacts to workers. Due to the short duration of construction (seven months), the low probability of a strong seismic event occurring during the construction timeframe, and safety training for construction crews, the potential construction impact would be less than significant.

Operation A significant seismic event is likely to occur over the lifetime of the project. Shaking associated with a seismic event could cause damage to built features of the project, including the new segments of floodwall, streambank stabilization structures, and the stormwater pump station.

Unit 4

The grading and streambank stabilization improvements to the natural creek channel would have the overall effect of increasing stability by incorporating bank stabilization and vegetation into the design that would limit erosion. The streambank stabilization measures would reduce susceptibility of the creek banks to failure caused by seismic shaking and seismically induced ground failures. Because the project would increase the channel stability in Unit 4 through implementation of streambanks stabilization measures, the impact on risk of loss, injury, or death from seismic shaking would be less than significant.

Frederick Allen Park

The existing flood control channel wall is a concrete structure that is prone to damage under strong seismic events, whereas the proposed natural vegetated channel in Frederick Allen Park would be less prone to damage and loss under a strong seismic event. The new segments of retaining wall within Frederick Allen Park (at the transition to Unit 4 and at the transition to the concrete channel in lower Unit 3) would be up to 10 feet tall and could be prone to damage and loss in the event of strong seismic shaking if appropriate geotechnical evaluation and recommendations were not implemented. The damage or loss of the retaining wall in Frederick Allen Park due to strong seismic shaking would be a significant impact. The District would implement **Mitigation Measure 3.6-1: Geotechnical Investigation Report**, which requires a site-specific geotechnical investigation and implementation of the geotechnical recommendations that would address risk of seismicity. Because the mitigation requires implementation of the geotechnical recommendations, the impact from strong seismic shaking would be less than significant with mitigation.

Unit 3 and Unit 2 Floodwalls and Stormwater Pump Station

The new segments of floodwall in Units 3 and 2 would be generally 2 to 4 feet tall. The floodwall would be designed in accordance with the U.S. Army Corps of Engineers (USACE) design requirements and is subject to USACE approval under Section 408. The floodwall would be designed to meet current design standards to avoid increased risk of structural failure in the event of strong seismic shaking. While the floodwall would be short (2 to 4 feet tall) and not in proximity to people or other structures, failure of the floodwall as a result of seismic shaking could result in risk of loss, injury or death if the floodwall were not repaired prior to a major storm/flood event. If the floodwall were damaged and not repaired, increased flooding and damage could occur in areas that are being protected by the floodwall, which would be a significant impact. **Mitigation Measure 3.6-1: Geotechnical Investigation Report** requires a site-specific geotechnical investigation and implementation of the geotechnical recommendations in final design of the floodwalls to address the risk of structural damage due to seismicity. The new floodwall segments in Units 2 and 3 would have less-than-significant impacts with mitigation related to risk of loss, injury, or death from seismic shaking.

The stormwater pump station would be below grade with the exception of a utility cabinet that would extend approximately 6 feet above grade. The utility cabinet would be an isolated structure that would not be located near any homes or people. The belowground pump station components have been engineered and are located adjacent to the existing concrete flood control channel wall. The additional concrete and pump station components would not increase the risk of floodwall failure. The stormwater pump station would not increase risk of loss, injury or death due to seismic shaking because the pump station would not be located near people or other structures and would not be vulnerable to collapse; therefore, the impact would be less than significant.

Lower College of Marin Concrete Removal

The concrete removal in lower Unit 2 would result in a natural channel that would have reduced risk of failure from strong seismic shaking because the channel would be gently sloped

and vegetated. The concrete removal in Unit 2 would not introduce any infrastructure that could result in risk of loss, injury, or death from seismic shaking. The operation of the Unit 2 concrete channel removal would have a less-than-significant impact on risk of loss from seismic shaking.

Seismic-Related Ground Failure

Liquefaction is the phenomenon in which saturated granular sediments temporarily lose their shear strength due to increases in pore pressure during periods of earthquake-induced strong groundshaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments and the magnitude and frequency of earthquakes in the surrounding region. Saturated, unconsolidated silts, sands, and silty sands within 50 feet of the ground surface are most susceptible to liquefaction. Liquefaction-related phenomena include lateral spreading, ground oscillation, flow failures, loss of bearing strength, subsidence, and buoyancy effects.

Lateral spreading is a seismically induced ground deformation failure in which near surface soil layers typically break into blocks that progressively move downslope or toward a nearby free face such as a stream channel, river embankment, or a shoreline. Structural elements (e.g., concrete channel, grade control, and slope protection, etc.) that extend through or across a zone of lateral spreading may be pulled apart or sheared.

The project area is in an area mapped by U.S. Geological Survey as having "very high" liquefaction susceptibility (USGS, 2006). Potentially liquefiable materials within the project area include loose sandy layers in the valley fill and soft sandy silt in the creek sediments. Groundwater in the channel is approximately 5 feet below grade in Unit 3. The Bay Mud underlying the downstream of Stadium Way pedestrian bridge in Unit 2 has low potential for liquefaction.

Construction

Construction would introduce construction workers to the area for up to seven months. The construction period would involve grading, removal of concrete, planting, and installation of new concrete floodwalls. Construction would not introduce large structures to the area that would put people at risk of injury or death from liquefaction. Due to the low number of workers (less than 100) that would be required during construction, short duration of construction, and low height of project structures, project construction would have a less-than-significant impact on liquefaction.

Operation

Liquefaction-induced lateral spreading could occur along the floodwalls and slopes with valley fill. Removal of the concrete flood control channel in Frederick Allen Park and lower Unit 2 and the rocks and riprap proposed in Units 4 and 2, and Frederick Allen Park would improve stability of the channel banks and reduce the potential for impacts related to lateral spreading. Because the project would reduce the area of concrete structures that could be subject to damage in the event of liquefaction or lateral spreading, and the project would be designed to

meet stringent federal and state seismic design standards, the project would be less prone to damage form liquefaction and lateral spreading than the existing conditions. As such, the project would not expose persons or structures to substantial adverse effects or exacerbate existing conditions related to ground failure, including liquefaction and the impact would be potentially beneficial and less than significant.

Landslides

The project area is located mostly within flat lands with surrounding slopes identified as containing few if any landslides. A search of the U.S. Landslide Inventory indicated that no landslides have been mapped within the proximity of the project area (USGS, 2020). As discussed above in Section 3.6.3 Environmental Setting, recent storms in 2017 have triggered numerous landslides upstream in Unit 4, but these are small scale events caused by the incised channel and instability from development along the creek. The project would include installation of grade control structures to stabilize the creek banks in Unit 4, which would reduce the risk of landslides in the area. The project would not increase the risk of landslides. No landslide-related impact would occur.

Mitigation: Implement Mitigation Measure 3.6-1.

Mitigation Measure 3.6-1: Geotechnical Investigation Report

The District shall have a professional geotechnical engineer conduct a geotechnical investigation to evaluate the potential for geotechnical hazards to occur on-site in accordance with the recommendations of the California Geological Survey. The Geotechnical Investigation Report shall provide site-specific recommendations for structures (e.g., floodwalls, fish pools, and stormwater pump station), work areas, and access routes where there is an elevated risk of geologic hazards. The Geotechnical Investigation Report shall be incorporated into the final project design of the retaining walls and floodwalls. The Geotechnical Investigation Report shall specify exact design coefficients that are needed by structural engineers to determine the type and sizing of structural materials. The Geotechnical Investigation Report shall be subject to performance criteria imposed by the California Building Code, as applicable. The Geotechnical Investigation Report shall be prepared by a registered civil engineer or certified engineering geologist and include appropriate measures to minimize seismic hazards and ensure structural safety of the proposed structures.

Significance after Mitigation: Mitigation Measure 3.6-1 would require the District to prepare a geotechnical investigation report and incorporate geotechnical recommendations in the final design. Implementation of Mitigation Measure 3.6-1 would reduce the impact from seismic shaking during operation to less than significant because the project would be designed to avoid damage from strong seismic events.

	Significance Determination
Impact 3.6-2: The project would not result in substantial soil erosion or the loss of topsoil.	**Construction: Less than Significant** **Operation and Maintenance: Less than Significant**

Construction

Project construction would include soil disturbing activities, including removal of the concrete channel within Frederick Allen Park and lower Unit 2, grading in Unit 4, tree removal, and excavation of larger fish pools. Without proper soil stabilization controls, construction activities including excavation and grading, and tree removal can increase the potential for exposed soils to be eroded by wind or stormwater runoff, resulting in long term soil loss. As discussed in Section 3.9 Hydrology and Water Quality, land disturbance associated with the project would be more than 1 acre and coverage under the Construction General Permit would be required. The proposed project would be required to develop and implement a SWPPP. Construction activities would be conducted consistent with Water Discharge Requirements prescribed for compliance with the state's Porter-Cologne Water Quality Control Act and BMPs outlined in the SWPPP. In conformance with the SWPPP and construction standards, erosion control methods would be implemented to prevent loss of soil at all work sites. The project design includes streambank stabilization measures to reduce the potential for soil loss, as described in Chapter 2, Project Description. In addition, Marin County has adopted the CBC Appendix J grading requirements, including preparing and maintaining the cut and fill slopes to control erosion. The streambank stabilization measures included in the project design and implementation of the sediment and erosion control BMPs included in the SWPPP would ensure that soil erosion and the loss of topsoil immediately following construction are less than significant.

Operation and Maintenance

The project will require removal of trees and vegetation within Frederick Allen Park and within Unit 2 to create natural habitat. The area of tree removal would be replaced with native vegetation including shrubs, grasses, and riparian trees. Revegetation would provide long-term stabilization to avoid substantial soil loss. The area of grading and excavation at the stormwater pump station and the floodwalls would be permanently stabilized by the project elements that would be installed in the area, including gravel and concrete. Long-term maintenance activities would include maintenance of landscaping and streambank stabilization control structures to ensure they function over the project life. Maintenance activities also include maintenance of vegetation and removal of sediment from the fish pools. The removal of sediment from the project fish pools would be similar sediment removal from the existing fish pools and the impact would be less than significant. Maintenance activities would ensure proper function of the project and long-term effectiveness of streambank stabilization features. The impacts from erosion and soil loss would be less than significant because the project design incorporates revegetation and streambank stabilization features to minimize soil loss.

Mitigation: None required.

	Significance Determination
Impact 3.6-3: The project would 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.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Geologic and Soil Unit Stability

The project area consists of three geologic units, including the Franciscan Formation, Bay Mud, and valley fill/alluvium. The Franciscan Formation bedrock and valley fill/alluvium are comparatively strong and competent foundation materials. Bay Mud consists of silts and clays that are very soft and structurally weak. Bay Mud is found downstream of Stadium Way pedestrian bridge in Unit 2 beneath the artificial fill. Upstream from Stadium Way pedestrian bridge, Bay Mud is reportedly absent. As discussed in the Environmental Setting, the Franciscan Formation bedrock is approximately 35 to 40 feet below ground surface near the upstream end of the project and approximately 40 feet below ground surface near Kentfield and increases in depth towards the Bay. The project would require grading and excavation within Frederick Allen Park, Unit 4, and lower Unit 2. The grading and excavation would be greatest at Frederick Allen Park and would extend up to 10 feet below the current ground surface. The potential for the project to encounter bedrock is low because the maximum excavation would not extend to bedrock. The soil types underlying the project include Tocaloma-McMullin-Urban Land Complex and Xerorthents-Urban land complex (USDA, 2020). These urban land complex soils likely consist of artificial fill materials that have been compacted by roadways, the concrete channel, and urban activity.

Retaining Walls and Floodwalls

The project would include installation of 10-foot tall retaining walls in the approximate location of the existing flood control channel at the upstream end of Frederick Allen Park and connection to Unit 4 and at the downstream end of Frederick Allen Park, construction of larger fish pools within the concrete channel in Unit 3, installation of 2 to 4 foot tall floodwalls along the existing floodwall, removal of portions of the concrete channel to create natural habitats in Frederick Allen Park and at lower College of Marin, and installation of a stormwater pump station. The new structures including the retaining walls and floodwalls would be installed on soil units that primarily consist of urban fill in the urban environment. The Franciscan Formation and valley fill alluvium underlying the retaining walls and floodwalls are stable geologic and soil units and the soils would not become unstable as a result of the retaining wall or floodwall installation. The retaining walls and floodwalls would be similar to the existing concrete channel floodwalls and would not cause geologic or soil instability; therefore, the impact would be less than significant.

Frederick Allen Park and Fish Pools

The excavation of the floodplain at Frederick Allen Park and excavation of larger fish pools within the concrete channel would occur within the Franciscan formation and valley fill alluvium, which are stable soil and geologic units. The project would include installation of streambank stabilization measures including large rock, vegetated soil lifts, and landscaping

within Frederick Allen Park and immediately upstream. The project also includes installation of concrete and rock within the fish pools. The project would not cause geologic or soil units to become unstable because the underlying geologic and soil units are stable, and the project has incorporated soil stabilization measures into the design. The impact form construction of the floodplain and habitat at Frederick Allen Park and the fish pools would be less than significant because the habitat and fish pools would be located on stable geologic and soil units and the project design includes soil stabilization features.

Lower College of Marin

The Bay Mud underlying the lower College of Marin concrete channel removal area is weak. The lower College of Marin concrete channel removal work involves removal of a portion of the existing concrete channel and riprap, creating a less steeply sloped habitat area and planting the area to establish saltwater marsh and transitional habitat. Riprap would be reinstalled as needed for stability. The reduced slope of the created habitat relative to existing conditions, and use of soil stabilization, including riprap reuse, would generally stabilize the underlying soils. In addition, Marin County Municipal Code requires the Department of Public works to review acceptable soils and geologic reports prior to construction activities located on Bay Mud. Per these regulatory requirements, the geotechnical investigation report for the lower College of Marin concrete channel removal, which is located on Bay Mud, will include detailed information related to soils matters such as stability, erosion; and settlement, and will include recommendations for remediating expansive soils, which may include, for example, removal of these soils and replacement with engineered fill. With adherence to the Marin County Municipal Code, the project would have a less than significant impact due to its location on unstable soil units.

Subsidence

Subsidence is commonly associated with severe, long-term withdrawal of groundwater in excess of recharge that eventually leads to overdraft of the aquifer. The project would include temporary groundwater dewatering in the location of excavation including the fish pools and lower Unit 2 construction. Groundwater dewatering would be localized and would only occur for a few weeks during construction in each area. No long-term groundwater withdrawal would occur. The short-term dewatering would not cause subsidence. No subsidence-related impacts would occur.

Liquefaction, Lateral Spreading and Landslides

Liquefaction, lateral spreading, and on- or off-site landslide impacts as analyzed above in Impact 3.6-1. The impact from liquefaction and lateral spreading would be less than significant, as discussed in Impact 3.6-1. The project would not result in a landslide on or off-site. No landslide impact would occur.

Mitigation: None required.

	Significance Determination
Impact 3.6-4: The project would not be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), and thus would not create substantial direct or indirect risks to life or property.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

The soil types underlying the project include Tocaloma-McMullin-Urban Land Complex and Xerorthents-Urban land complex. The Tocaloma-McMullin complex has low extensibility, or expansion potential. The extensibility rating for the Xerorthents-Urban land complex was not available from the NRCS web soil survey. However, the soil expansion potential is anticipated to be low because the soil complex is fill and heavily developed. The project does not involve construction of habitable structures or structures that could create a substantial risk to life or property in the case of soil expansion. The floodwalls will be located on top of existing floodwalls or setback from existing floodwalls and would not change the soil types or risk of expansive soils below the existing floodwalls. Marin County Municipal Code requires the Department of Public works to review acceptable soils and geologic reports prior to construction activities located on Bay Mud. Per these regulatory requirements, the geotechnical investigation report for the lower College of Marin concrete channel removal, which is located on Bay Mud, will include detailed information related to soils matters such as stability, erosion; and settlement, and will include recommendations for remediating expansive soils, which may include, for example, removal of these soils and replacement with engineered fill. With adherence to the Marin County Municipal Code, the project would have a less than significant impact with respect to expansive soils.

Mitigation: None required.

	Significance Determination
Impact 3.6-5: The project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Overview

Portions of the project area where ground disturbance will occur are underlain by Late Pleistocene and Holocene Bay Mud and valley fill/alluvium. Typical valley fill/alluvium in the project area consists of mixtures of alluvial soils and slope wash from the adjoining hills. Because it consists of recently deposited sediments, surficial exposures of alluvium are considered to have low potential for paleontological resources. Although numerous invertebrate fossils such as mollusk shells have been observed in the Young Bay Mud, due to its young age, the Holocene Young Bay Mud is considered to have low potential for significant fossils. The project is not located near or within a unique geologic feature. Therefore, the project would not affect a unique geologic feature.

Construction

Construction of the project would require ground-disturbing and excavation during removal of the fish ladder and grading of Unit 4, removal of the concrete channel and construction of a

floodplain and realigned channel in Frederick Allen Park, excavation of larger fish pools, construction of the stormwater pump station, and removal of concrete at the lower College of Marin. There is a low potential to uncover previously undiscovered paleontological resources during ground-disturbing work because paleontological resources are not anticipated in sediments and rocks in the project area. The impact of construction on paleontological resources is less than significant.

Operation and Maintenance
Once constructed, the project would include maintenance activities, such as vegetation management, sediment and debris removal, and storm drain pump station and floodwall maintenance. These activities would not include ground-disturbing work. No impact on paleontological resources would occur.

Mitigation: None required.

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3.7 Greenhouse Gas Emissions

3.7.1 Introduction

This section addresses the existing greenhouse gas (GHG) emissions conditions and presents an evaluation of the potential GHG emissions effects from implementation of the project. The GHG emissions analysis is based on GHG emissions modeling of project construction and operation activities. Modeling assumptions and calculations are provided in Appendix C.

3.7.2 Scoping Comments

Comments related to GHG emissions impacts were received during the public scoping process. These comments and the location where they are addressed in the GHG emissions analysis are provided in Table 3.7-1.

Table 3.7-1 Greenhouse Gas Emissions Scoping Comments

Agency/Entity	Comment	Location in GHG Emissions Section that Comment is Addressed
California State Lands Commission	A GHG emissions analysis consistent with the California Global Warming Solutions Act (Assembly Bill [AB] 32) and required by the State CEQA Guidelines should be included in the Draft EIR. This analysis should identify a threshold for significance for GHG emissions, calculate the level of GHGs that will be emitted as a result of construction and ultimate build-out of the Project, determine the significance of the impacts of those emissions, and, if impacts are significant, identify mitigation measures that would reduce them to the extent feasible. For the proposed Project, the removal and disposal of the concrete in Unit 2 may result in substantial emissions.	Section 3.7.6 and Appendix C

3.7.3 Environmental Setting

Climate Change

Overview

Global climate change refers to changes in average climatic conditions on earth as a whole, including changes in temperature, wind patterns, precipitation, and storms. Historical records indicate that global climate changes have occurred in the past due to natural phenomena; however, current data increasingly indicate that current global conditions differ from past climate changes in rate and magnitude. Global climate change attributable to anthropogenic (human) GHG emissions is currently one of the most important scientific, economic, and political issues in the United States and the world. The appropriate actions to limit and/or

respond to climate change are the subject of significant and rapidly evolving regulatory efforts at the federal and state levels of government.

The scientific community's understanding of the fundamental processes responsible for global climate change has improved over the past decade, and its predictive capabilities are advancing. However, there remain significant scientific uncertainties in, for example, predictions of local effects of climate change; occurrence, frequency, and magnitude of extreme weather events; effects of aerosols; changes in clouds; shifts in the intensity and distribution of precipitation; and changes in oceanic circulation. Due to the complexity of the Earth's climate system and inability to accurately model it, the uncertainty surrounding climate change may never be completely eliminated. Nonetheless, the International Panel on Climate Change's (IPCC) *Fifth Assessment Report, Summary for Policy Makers* states, "It is extremely likely that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic forces together" (IPCC, 2014). A report from the National Academy of Sciences concluded that 97 to 98 percent of the climate researchers most actively publishing in the field support the tenets of the IPCC in that climate change is very likely caused by human (i.e., anthropogenic) activity (Anderegg, Prall, Harold, & Schneider, 2010).

Effects of Climate Change

Some of the effects of global warming in California are likely to include loss of snowpack, reduced water availability, declining crop yields, sea-level rise, more extreme heat days per year, more high ozone days, more large forest fires, more drought years, increased erosion of California's coastlines and sea-water intrusion into the Sacramento and San Joaquin Deltas and associated levee systems, and increased pest infestation (CARB, 2008; USEPA, 2016). Globally, climate change has the potential to adversely affect numerous environmental resources through impacts related to future air temperatures and precipitation patterns. According to the IPCC, the projected effects of global warming on weather and climate are likely to vary regionally but are expected to include the following direct effects (IPCC, 2014):

- Warmer and/or fewer cold days and nights over most land areas
- Warmer and/or more frequent hot days and nights over most land areas
- Warm spells/heat waves, including increased frequency and/or duration over most land areas
- Heavy precipitation events, including increased frequency, intensity, and/or amount of heavy precipitation
- Increase in intensity and/or duration of drought
- Increase in intense tropical cyclone activity
- Increased incidence and/or magnitude of extreme high sea level

Climate change is projected to cause many secondary effects as well, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully

understood and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be great.

Sources of Greenhouse Gas Emissions

There are two broad sources of GHG emissions: anthropogenic and biogenic.

- Anthropogenic GHG emissions derive from the combustion of fossil fuels. Energy-related CO_2 emissions, resulting from fossil-fuel exploration and use, account for approximately 85 percent of the human-generated GHG emissions in the United States, primarily in the form of CO_2 emissions from burning fossil fuels (USEPA, 2017). Anthropogenic emissions also include byproducts of certain human--managed biological processes, such as anaerobic decomposition of organic waste in landfills, wastewater treatment, and treatment of wastes from confined animal facilities such as dairies. Indirect anthropogenic effects on GHG emissions includes changes in land use from uses with high levels of carbon sequestration, such as forests, to agricultural or urban uses.
- Biogenic GHG emissions are derived from natural sources, including the natural decomposition of biomass[1] and combustion of biomass or biomass-derived fuels.

The distinction between anthropogenic and biogenic sources of GHG emissions is important because these sources have different impacts on the global carbon cycle. Carbon in fossil-fuel reservoirs, such as coal seams and oil and gas deposits, was removed from the atmosphere by plants over millions of years. Through geologic processes, this carbon accumulated in deposits and was isolated from the active carbon cycle. Without human intervention, fossil-fuel carbon would remain isolated from the active carbon cycle into the future. Through extraction and combustion of fossil fuels, humans release this carbon, increasing the total amount of carbon in the atmosphere and in the active carbon cycle (USEPA, 2011).

In contrast to fossil-fuel carbon, carbon present in biomass is cycling through the atmosphere and global carbon cycle on a much faster scale. Over short time scales, the mass of carbon released by the decomposition of biomass will generally equal the mass of carbon taken up by living organisms. Because biogenic carbon is constantly being released and taken up in the carbon cycle, biogenic CO_2 emissions do not act to increase the total amount of carbon in the atmosphere in the same way as the release of carbon from fossil fuels (USEPA, 2011).

Types of Greenhouse Gases

The greenhouse gas effect is responsible for maintaining a habitable climate. The most common GHGs are CO_2 and water vapor. Other critical GHGs include methane (CH_4), nitrous oxide

[1] Biomass is non-fossilized organic matter from plants, animals, and microorganisms, including products, byproducts, and wastes from agriculture, forestry and related industries as well as the non-fossilized biodegradable fractions of industrial and municipal wastes, including gases and liquids recovered from its decomposition.

(N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). GHGs are released into the earth's atmosphere through a variety of natural processes and human activities. Each GHG has its own potency and effect upon the earth's energy balance, expressed in terms of a global warming potential (GWP). Some common emissions sources of GHGs are listed in Table 3.7-2. The GWPs provided in Table 3.7-2 are values based on the latest science in the IPCC's Fifth Assessment Report (AR5) (IPCC, 2013).

As shown below, CO_2 is assigned a value of 1, and SF_6 is several orders of magnitude stronger, with a GWP of 23,500 (IPCC, 2013). In GHG-emission inventories, the weight of each gas is multiplied by its GWP and is measured in units of equivalent CO_2 (CO_2e). By applying the GWP ratios, project-related CO_2e emissions can be tabulated in metric tons per year. Typically, the GWP ratio corresponding to the warming potential of CO_2 over a 100-year period is used as a baseline.

Table 3.7-2 Greenhouse Gas Emissions Sources and GWP

GHG	Example Source	GWP
CO_2	Energy generation	1
CH_4	Livestock; landfill operation	28
N_2O	Transportation; crop fertilization	265
HFCs	Refrigeration and cooling	138[a]
PFCs	Semi-conductor manufacturing	8,900[b]
SF_6	Gas-insulated switchgear	23,500

Notes:

[a] GWPs of HFCs range. This value was calculated for HFC-152a.

[b] GWPs of PFCs range. This value was calculated for PFC-218.

Source: (IPCC, 2014)

Greenhouse Gas Emission Inventory

National

Anthropogenic GHG emissions in the United States are derived mostly from the combustion of fossil fuels for transportation and power production. The total national anthropogenic GHG emissions in 2015 were approximately 6,587 million metric tons of CO_2e. Energy-related CO_2 emissions resulting from fossil-fuel exploration and use account for more than three-quarters of the human-generated GHG emissions, primarily in the form of CO_2 emissions from burning fossil fuels. Twenty-nine percent of the GHG emissions were generated from electricity production, such as power plants; 27 percent from transportation; and 21 percent from industrial processes, while the remaining sources include agriculture, forestry, residential and commercial uses, and waste management (USEPA, 2017).

Statewide

Total gross estimated California GHG emissions in 2017 were 424 million metric tons of CO_2 equivalent ($MTCO_2e$), five $MMTCO_2e$ lower than 2016 levels and seven $MMTCO_2e$ below the 2020 GHG Limit established by CARB in the 2014 Scoping Plan of 431 $MMTCO_2e$ (CARB, 2019a). Table 3.7-3 shows the Statewide GHG emissions for the years 1990 and 2017 (CARB, 2019b).

Table 3.7-3 California Greenhouse Gas Inventory

Source Category	1990 (million $MTCO_2e$)	2017 (million $MTCO_2e$)
Total energy	386.41	348.9
Industrial processes and product use	18.34	33.6
Agriculture, forestry and other land use	19.11	30.7
Waste	9.42	10.8
Gross California GHG emissions	**433.29**	**424.1**

Sources: (CARB, 2007; CARB, 2017)

During the 2000 to 2017 period, per capita GHG emissions in California dropped from a 2001 peak of 14.1 tons per person to 10.7 tons per person in 2017, a 24 percent decrease. The reductions in California GHG emissions during this period are attributed to energy efficiency and conservation efforts (CARB, 2019b).

Regional

Total GHG emissions in the San Francisco Bay Area Air Basin (SFBAAB) steadily increased by 29 percent between 1990 and 2011, to a total of 86.6 $MTCO_2e$ in 2011, as shown in Table 3.7-4. Between 1990 and 2011, per capita emission rates in SFBAAB increased by approximately five percent (BAAQMD, 2015). Total emissions have increased since 1990 compared to both 2011 and 2015, but in 2015 total GHG emissions decreased approximately by two percent compared to 2011, as shown in Table 3.7-4 and Table 3.7-5.

Local

Conversely to the overall SFBAAB, emissions in Marin County have declined since 1990, starting in 2010, with a decrease in emissions of 24 percent in 2017 compared to 1990 as shown in Table 3.7-6. Per capita GHG emissions have also decreased since 1990 (Marin County, 2019).

Table 3.7-4 SFBAAB Greenhouse Gas Inventory

Source Category	1990 (million $MTCO_2e$)	2011 (million $MTCO_2e$)
Transportation	28.6	34.3
Industrial/commercial	21.0	31.0
Electricity/co-generation[a]	8.4	12.1
Residential fuel usage	7.0	6.6
Agriculture/farming	1.2	1.3
Off-road equipment	0.9	1.3
Total SFBAAB GHG emissions	**67.1**	**86.6**

[a] Includes imported electricity emissions of 2.7 million $MTCO_2e$.

Source: (BAAQMD, 2015)

Table 3.7-5 SFBAAB Greenhouse Gas Inventory (Percent)

Source Category	2015
Transportation	41%
Industrial	26%
Electricity/co-generation	14%
Residential/commercial	10%
Agriculture/farming	1%
Recycling/waste	3%
High GWP gases	4%
Total SFBAAB GHG emissions	**100% (84.7 million MTCO2e)**

Source: (BAAQMD, 2017a)

Table 3.7-6 Marin County Greenhouse Gas Inventory

Source Category	1990 ($MTCO_2e$)	2017 ($MTCO_2e$)
Transportation	193,544	157,523
Commercial energy	74,190	33,278
Residential energy	131,265	78,732
Agriculture	122,366	118,665
Off-road	19,300	17,127
Waste	14,414	17,301
Water	1,319	260
Wastewater	5,453	5,663
Total Marin County GHG Emissions	**561,851**	**428,549**

Source: (Marin County, 2019)

Urban Microclimate

Vegetation and impervious surfaces have a significant effect on localized temperature and trees, and vegetation can minimize extreme air temperature. The first mechanism by which this occurs is that tree and vegetative cover shade impervious surfaces, preventing solar radiation from absorbing into the surface and preventing heat storage. Shade can minimize the urban heat-island effect, in which an urban area is significantly warmer than the surroundings due to reflective surfaces. Urban tree-canopy cover is critical in moderating the heat-island effect, which poses a threat to human health. The second mechanism is that trees transpire water, leading to transpirative cooling (McDonald, Kroeger, Boucher, Longzhu, & Salem, 2016). Impervious surfaces, conversely, cause an increase in localized temperatures. A study of the relationship between canopy cover and impervious cover and the effect on temperature found that, as impervious surface cover increased, temperature increased linearly. However, as canopy cover increased, temperature decreased at a greater rate than linearly (Ziter, Pedersen, Kucharik, & Tumer, 2019).

3.7.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project and are defined as standard conditions for the project.

Federal Regulations

United States Environmental Protection Agency – Clean Air Act

On April 2, 2007, the Supreme Court found in Massachusetts v. USEPA that GHGs are air pollutants under the Clean Air Act. USEPA, therefore, has the authority to regulate GHG emissions. The Supreme Court found that the Clean Air Act authorizes USEPA to regulate motor vehicle GHG emissions if USEPA determines they cause or contribute to air pollution

that may reasonably be anticipated to endanger public health or welfare (USEPA, 2017). These GHG emissions should be evaluated as part of a project's GHG emissions inventory.

State Regulations

California Air Resources Board – Global Warming Solutions Act of 2006 (Assembly Bill 32)
In September 2006, the State legislature passed, and Governor Schwarzenegger signed, AB 32 (Chapter 488, States of 2006), the Global Warming Solutions Act of 2006, which set the 2020 GHG emissions-reduction goal into law. The Global Warming Solutions Act of 2006 directed CARB to begin developing discrete early actions to reduce GHG emissions while also preparing the Climate Change Scoping Plan (Scoping Plan), which outlines a framework of measures that would eventually be adopted and implemented to reach AB 32 goals (CARB, 2017). CARB approved the Scoping Plan in 2008 and updated it in May 2014 (Scoping Plan First Update). The project is subject to the regulations and implementation measures outlined in the Scoping Plan to achieve AB 32 goals.

In September of 2016, AB 32 was extended to achieve reductions in GHG of 40 percent below 1990 levels by 2030. Adopted regulations that correspond to elements of the Scoping Plan include the 33 percent Renewable Portfolio Standard by 2020 (SB X1-2), the Cap-and-Trade Program, and the Low Carbon Fuel Standard. The updated Scoping Plan identifies actions for each sector (i.e., energy, transportation, agriculture, water, waste management) that California should take to meet its climate-change goals. Recommended actions of the Scoping Plan First Update, relevant to the Program, within CARB's purview, are generally related to Transportation and to Natural and Working Lands (CARB, 2014). The newest Scoping Plan, adopted in 2017, (2017 Scoping Plan) describes ongoing and proposed programs and policies to achieve the 2030 GHG emissions target for several sectors (i.e., energy, transportation, industry, water, waste management, and natural and working lands) (CARB, 2017).

California Air Resources Board – Sustainable Communities and Climate Protection Act of 2008 (Senate Bill 375)
Senate Bill (SB) 375, signed by Governor Schwarzenegger in September 2008, aligns regional transportation planning efforts, regional GHG emission-reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy showing prescribed land-use allocation in each MPO's Regional Transportation Plan. CARB, in consultation with the MPOs, is to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in their respective regions for 2020 and 2035.

The applicable MPO in the project areais the Metropolitan Transportation Commission (MTC). MTP, in conjunction with the Association for Bay Area Governments (ABAG), adopted Plan Bay Area in 2013, which includes the Bay Area region's Sustainable Communities Strategy and the 2040 Regional Transportation Plan. The project is subject to the regulations and implementation measures outlined in Plan Bay Area in 2013 and 2040 Regional Transportation Plan to achieve the goals of SB 375.

Regional and Local Regulations

Metropolitan Transportation Commission and the Association for Bay Area Governments
Pursuant to SB 375, the MTC and ABAG was tasked by CARB to achieve a 10 percent per capita reduction in passenger-vehicle generated transportation emissions by 2020 and a 16 percent per capita reduction by 2035 from 2005 levels, which CARB confirmed the region would achieve by implementing its Sustainable Communities Strategy.

MTC and ABAG have worked together to craft Plan Bay Area 2040, an update to the previous plan, to identify opportunities that can help steer the region toward the set goals. Plan Bay Area 2040 was adopted in July 2017 and integrates transportation, land use, and housing to meet greenhouse gas reduction targets set by CARB (MTC, 2017).

Marin County – Marin Countywide Plan
The following goals and policies in the Marin Countywide Plan are relevant to the project's GHG emissions (Marin County , 2007).

Goal AIR-4: Minimization of Contributions to Greenhouse Gases. Prepare policies that promote efficient management and use of resources in order to minimize greenhouse gas emissions. Incorporate sea level rise and more extreme weather information into the planning process.

> ***Policy AIR-4.1: Reduce Greenhouse Gas Emissions***. Adopt practices that promote improved efficiency and energy management technologies; shift to low-carbon and renewable fuels and zero emission technologies.
>
> > *Implementing Program AIR-4.c: Reduce Methane Emissions Released from Waste Disposal.* Encourage recycling, decrease waste sent to landfills, require landfill methane recovery, and promote methane recovery for energy production from other sources. (See Goal PFS-3.)

Goal EN-3: Adopt Green Building Standards. Integrate green building requirements into the development review and building permit process.

> ***Policy EN-3.1: Initiate Green Building Initiatives***. Encourage and over time increasingly require sustainable resource use and construction with nontoxic materials.
>
> > *Implementing Program EN-3.c: Divert Construction Waste*. Continue to implement and improve the Construction and Demolition Waste Recovery Ordinance, requiring building projects to recycle or reuse a minimum of 50% of unused or leftover building materials.

Marin County – Climate Action Plan
The Marin County Unincorporated Area Climate Action Plan 2030 Update was adopted by the Board of Supervisors on December 8, 2020. The Climate Action Plan 2030 Update outlines a

path to reduce GHG emissions through the year of 2030. (Marin County , 2020). The Marin County Unincorporated Area Climate Action Plan 2030 includes two targets:

- Reduce GHG emissions from community activities in the unincorporated areas of Marin County by at least 60 percent below 2005 levels by 2030; and
- Reach net zero emissions by 2045.

The following strategies and actions are included in the 2030 Climate Action Plan that are related to GHG emission reduction.

WR-C3: Construction & Demolition Debris and Self-Haul Waste:

1. Require all loads of construction and demolition debris and self-haul waste to be processed for recovery of materials as feasible.

AG-C3: Urban Forest and Food Production and Natural Lands Management:

2. Improve ecosystem health by planting additional trees on County-owned land, including public parks, open space, medians, and rights of way.
4. Require that site planning, construction, and maintenance of new development preserve existing healthy trees and native vegetation on site to maximum extent feasible. Replace trees and vegetation not able to be saved, preferably with appropriate native species.

The 2030 Climate Action Plan includes a variety of regulatory, incentive-based, and market-based strategies that are expected to reduce GHG emissions from both existing and new development in Marin County. The GHG emissions inventory in the plan included emissions for off-road construction equipment (based on CARB's OFFROAD model)[2] that apply to construction emissions in unincorporated Marin County.

Town of Ross Climate Action Plan

The Climate Action Plan describes the efforts and actions Ross can take to reduce its greenhouse gas emissions and mitigate, to the extent feasible at the local level, the potential impacts of climate change (Town of Ross, 2010). The recommended actions include the following:

- Support the Street Tree Committee's efforts to develop and implement a community-wide tree planting program for streets and parks to significantly increase the carbon-storage potential of trees and other vegetation in the community.
- Encourage the use of fuel-efficient and low GHG-emitting vehicles and driver behaviors.

[2] See https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/msei-road-documentation-0.

- Adopt and implement a policy requiring limitations on idling for commercial vehicles, construction vehicles, buses and other similar vehicles, beyond state law, where feasible.

3.7.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it would:

a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
b. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Given the specific location and nature of the project, impacts are analyzed in this section relative to the following additional threshold:

c. Alter air movement, moisture, or temperature, or cause any change in climate.

Significance Thresholds

Due to the complex physical, chemical, and atmospheric mechanisms involved in global climate change, it is challenging to conclude that a project's increase in annual GHG emissions would cause a measurable change in global GHG emissions necessary to influence global climate change. According to CAPCOA, "GHG impacts are exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective" (CAPCOA, 2008). It is global GHG emissions in their aggregate that contribute to climate change, not any single source of GHG emissions alone. The GHG emissions of a single project alone would not likely cause a direct physical change in the environment.

For land use projects with operations that are not stationary sources, the BAAQMD's CEQA Guidelines recommend use of an operational significance threshold of 1,100 metric tons CO_2e per year, and for stationary-source projects the recommended significance threshold is 10,000 metric tons CO_2e per year (BAAQMD, 2017b). This threshold was developed with consideration of the AB 32 emission- reduction goals. Therefore, even though the project is not a typical land use development project, this EIR nonetheless uses the significance threshold of 1,100 metric tons CO_2e per year to evaluate whether the project's GHG emissions could have a significant impact on the environment.

It is acknowledged that this significance threshold was developed to focus on emissions reductions by 2020, and that BAAQMD staff and CARB have not yet provided guidance or recommendations for significance thresholds to evaluate consistency with emissions reduction goals for years beyond 2020; however, the 1,100 metric tons CO_2e per year threshold can be used as a rough gauge to determine if the project would be consistent with these statewide GHG reduction goals.

The BAAQMD has not adopted a significance threshold for construction-related GHG emissions; however, it requires that the lead agency disclose those emissions and make a determination of impacts in relation to meeting AB 32 reduction goals. Construction-related GHG emissions from projects "occur over a relatively short-term period of time" and "contribute a relatively small portion of the overall lifetime project GHG emissions" (SCAQMD, 2008). In order to account for construction emissions and the fact that GHG emissions have long-lasting effects, technical guidance prepared by South Coast Air Quality Management District (SCAQMD) that has been accepted as the professional standard, recommends that construction GHG emissions should be "amortized over a 30-year project lifetime, so that GHG reduction measures will address construction GHG emissions as part of the operational GHG reduction strategies." In accordance with this technical guidance, GHG emissions generated from construction activities have been amortized over a projected 30-year lifetime of the project.

Approach to Impact Analysis

GHG emissions resulting from project-related incremental (net) increases in the use of off-road and on-road mobile vehicles were calculated and compared to existing conditions in order to evaluate project impacts. Project GHG emission calculations include project-construction activities such as demolition, hauling, and construction-worker trips. GHG emissions are estimated using CalEEMod, as described in detail in Section 3.2 Air Quality. Detailed calculations are provided in Appendix C of this Draft EIR. The average annual emissions from operational activities and amortized construction activities are compared to the BAAQMD annual emissions threshold.

3.7.6 Impact Discussion

Impacts Analyzed

	Significance Determination
Impact 3.7-1: The project would generate greenhouse gas emissions but would have a less-than-significant impact on the environment.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Vehicle and Equipment Emissions

GHG emissions would be generated primarily during project construction activities from the use of heavy-duty off-road construction equipment and automobile and truck trips to and from the project area required to transport workers, materials, and debris.

Once constructed, the project would include maintenance activities, such as vegetation management, sediment and debris removal, and stormwater pump station and floodwall maintenance. These activities would not include ground--disturbing work. General maintenance and inspection activities would be similar to existing conditions, resulting in no new net GHG emissions. Operation of the pump station and backup generator would emit GHGs during operation of the project. Table 3.7-7 presents construction and operational emissions generated by the project. The total operational and 30-year amortized construction

GHG emissions would be less than the BAAQMD operational threshold of 1,100 MT CO_2e per year, as shown in Table 3.7-7. The impact would be less than significant.

Table 3.7-7 Estimated GHG Emissions (metric tons CO_2e)

Unit	Project Element	Construction Emissions	Amortized Construction Emissions (30 years)	Operational Emissions	Total Annual Emissions
Unit 4	Fish ladder removal and Unit 4 grading	48.6	1.6	--	1.6
Unit 3	Frederick Allen Park	72.2	2.4	--	2.4
	Fish pools	100.5	3.4	--	3.4
	Floodwall (Segment #3)	20.3	0.7	--	0.7
	Stormwater pump station	25.9	0.9	17.7[a]	18.6
	Floodwall (Segment #2)	12.2	0.4	--	0.4
Unit 2	Floodwall (Segment #1)	17.2	0.6	--	0.6
	Lower College of Marin concrete channel removal	46.9	1.6	--	1.6
Total		**343.8**	**11.5**	**17.7**	**29.1**
BAAQMD significance thresholds					1,100
Threshold exceeded?					No

[a] The emission calculation conservatively assumed up to 50 hours of operation for testing the backup generator and operation of the 40 hp pumps for up to 66 days per year, based on historical days of precipitation in the Town of Ross.

Carbon Sequestration

Construction of the proposed project would involve removal of up to 369 trees from along the creek. The loss of these trees would constitute a loss of carbon sequestration and emissions of GHGs from decomposition of the chipped and cut material. The riparian habitat within Frederick Allen Park and the lower College of Marin concrete-channel-removal area would be enhanced and restored with natural vegetation. Up to 125 trees would be planted within Frederick Allen Park and more within the lower College of Marin area. A study of stream restoration in stream reaches across Marin, Napa, and Sonoma counties found that over a 45-year period, 16,217[3] metric tons of CO_2e accrued at a 1-kilometer representative stream restoration site (Lewis, 2015). In the short term, the proposed project would emit carbon from

[3] Value is accounting only for carbon accrual, soil and vegetation nitrogen account for additional accrual above baseline conditions.

use of equipment, vehicles, and carbon losses through vegetation removal. Planting of trees and vegetation would occur as part of the proposed project. The restored creek habitat would result in increased sequestration of carbon in the long term compared to existing conditions ensuring that significant impacts on carbon sequestration would not occur. Furthermore, as analyzed in Section 3.3 Biological Resources, the District would need to implement **Mitigation Measure 3.3-2b: Tree Mitigation** for the tree removal, which requires planting of a greater number of trees than would be removed by the proposed project. In the long term, more trees would be growing in the region and sequestering carbon than under existing conditions. The impact on carbon sequestration would be beneficial over time and less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.7-2: The project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Climate Change Scoping Plan

The Climate Change Scoping Plan lays out the framework for achieving compliance with the 2030 Statewide GHG target of 40 percent below 1990 levels. The State has promulgated specific laws aimed at GHG reductions, with the goal of achieving the statewide GHG reduction targets. Table 3.7-8 contains a list of GHG-reducing strategies potentially applicable to the project. The analysis describes the consistency of the project with these strategies that support the State's strategies in the Climate Change Scoping Plan to reduce GHG emissions. As shown below, the project would be subject to State and local requirements to reduce waste generation and reduce vehicle travel consistent with statewide strategies and regulations. As a result, the project would not conflict with applicable Climate Change Scoping Plan strategies and regulations to reduce GHG emissions.

Furthermore, in addition to the project's consistency with applicable GHG-reduction strategies, the project would not conflict with the future anticipated statewide GHG-reductions goals. CARB has outlined a number of potential strategies for achieving the 2030 reduction target of 40 percent below 1990 levels. These potential strategies include renewable resources for half of the State's electricity by 2030, increasing the fuel economy of vehicles and the number of zero -emission or hybrid vehicles, and reducing the rate of growth in vehicle miles traveled. The project would benefit from statewide and utility-provider efforts towards increasing the portion

Table 3.7-8 Consistency with Applicable State Greenhouse Gas Reduction Strategies

Strategy	Description	Discussion
	Energy	
California Renewables Portfolio Standard and SB 350	Increases the proportion of electricity from renewable sources to 33 percent renewable power by 2020.	**Consistent.** During operations, the pumps would use electricity provided by PG&E, which has already achieved 33 percent

Strategy	Description	Discussion
		renewables as of 2017 (CPUC, 2019) and is required to meet the 2050 performance standard.
	Mobile Sources	
Pavley Regulations (AB 1493)	Reduces GHG emissions in new passenger vehicles from model year 2012 through 2016 (Phase I) and model years 2017–2025 (Phase II). Also reduces gasoline consumption to a rate of 31 percent of 1990 gasoline consumption (and associated GHG emissions) by 2020.	**Consistent.** Worker and other light-duty vehicles used during construction are required to comply with these regulations. No conflict would occur.
Low Carbon Fuel Standard (Executive Order S-01-07)	Establishes protocols for measuring life-cycle carbon intensity of transportation fuels and helps to establish use of alternative fuels.	**Consistent.** The project would be consistent with this regulation and would not conflict with implementation of the transportation fuel standards.
Advanced Clean Cars Program	In 2012, CARB adopted the Advanced Clean Cars (ACC) program to reduce criteria pollutants and GHG emissions for model year vehicles 2015 through 2025. ACC includes the Low-Emission Vehicle (LEV) regulations that reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles, and the Zero-Emission Vehicle (ZEV) regulation, which requires manufacturers to produce an increasing number of pure ZEVs (meaning battery electric and fuel cell electric vehicles), with provisions to also produce plug-in hybrid electric vehicles (PHEV) in the 2018 through 2025 model years.	**Consistent.** The standards would apply to all vehicles used by construction workers and maintenance workers associated with the project. No conflict would occur.
	Solid Waste	
California Integrated Waste Management Act (IWMA) of 1989 and AB 341	The IWMA mandated that state agencies develop and implement an integrated waste-management plan that outlines the steps to be taken to divert at least 50 percent of their solid waste from disposal facilities. AB 341 directs CalRecycle to develop and adopt regulations for mandatory commercial recycling and sets a statewide goal for 75 percent disposal reduction by the year 2020.	**Consistent.** The demolition debris and soil, including the concrete, is anticipated to be recycled at the Marin Resource Recovery Center. Construction materials would be disposed of appropriately to meet recycling requirements. The project would comply with this regulation.

of electricity provided from renewable resources. The project would also benefit from statewide efforts towards increasing the fuel economy standards of vehicles. While CARB is in the process of developing a framework for the 2030 reduction target in the Scoping Plan, the project would support or not impede implementation of these reduction strategies identified by CARB.

2017 Clean Air Plan

As discussed in Section 3.2 Air Quality, one of the goals of BAAQMD's 2017 CAP is to protect the climate by reducing GHG emissions. No additional control measures beyond those discussed in Section 3.2 Air Quality apply to the project. Although GHG emissions generated by project activities would increase compared to existing conditions, as shown in Table 3.7-7, the project would not conflict with the 2017 CAP goal to achieve the State's GHG-reduction targets because GHG emissions would not exceed the BAAQMD significance threshold for GHGs. The project would comply with the BAAQMD GHG threshold identified to achieve the goals of the 2017 CAP.

Local GHG Reduction Plans and Policies

Marin County and Town of Ross have adopted climate action plans to reduce GHG emissions and meet the State's AB 32 goals. The Marin County Countywide Plan and Climate Action Plan include a number of actions to direct construction and demolition debris to a certified facility for recycling, maintain healthy ecosystems, and replace removed tress with native species. Table 3.7-9 contains a list of GHG-reducing policies, actions, or programs potentially applicable to the project. The analysis describes the consistency of the project with these policies, actions, and programs that support Marin County and the Town of Ross's regulations to reduce GHG-emissions.

Table 3.7-9 Consistency with Applicable Local Greenhouse Gas Reduction Policies, Actions, and Programs

Local Regulation	Policy/Action/Program	Discussion
Natural System		
Marin County Climate Action Plan Urban Forest and Food Production and Natural Lands Management Actions	Improve ecosystem health by planting additional trees on County-owned land, require siting planning, construction, and maintenance of new development, preserve existing healthy trees, and replace removed trees with native species.	**Consistent.** As part of the project, replacement trees and vegetation would be planted in the project area. The project would be required to plant more trees than those removed (as analyzed in Section 3.3 Biological Resources, Mitigation Measure 3.3-2b), ultimately increasing carbon sequestration in Marin County. No conflict would occur.
Town of Ross's Climate Action Plan recommended action for Natural Systems, Sequestration and Carbon Offsets	Support the Street Tree Committee's efforts to develop and implement a community-wide tree-planting program for streets and parks to significantly increase the carbon-storage potential of trees and other vegetation in the community.	
Mobile Sources		
Town of Ross's Climate Action Plan recommended actions for Land Use and Transportation	Encourage the use of fuel-efficient and low GHG-emitting vehicles and driver behaviors. Adopt and implement a policy requiring limitations on idling for commercial	**Consistent.** The project would use vehicles that are in compliance with the Pavley Regulations and the ACC program adopted by the CARB to

Local Regulation	Policy/Action/Program	Discussion
	vehicles, construction vehicles, buses, and other similar vehicles beyond state law, where feasible.	reduce criteria pollutant and GHG emissions. Construction activities would comply with Section 2485 of the California Code of Regulations and Mitigation Measure 3.2-2 that requires limitations on idling of equipment and vehicles. No conflict would occur.
	Solid Waste	
Marin County Climate Action Plan Waste Reduction Actions	Require all loads of construction and demolition debris and self-haul waste to be processed for recovery of materials as feasible.	**Consistent.** The District is anticipated to make use of the existing construction and demolition recycling infrastructure in the county by recycling the demolition debris and soil, including the concrete, at the Marin Resource Recovery Center. All other construction and demolition debris will be hauled to a certified facility for recycling. No conflict would occur.
Marin Countywide Plan Implementing Programs for Waste Disposal	Reduce methane emissions released from waste disposal, and divert construction waste	

Conclusion

In summary, the project is consistent with applicable regulatory plans and policies to reduce GHG emissions. The project would comply with strategies outlined in the Climate Change Scoping Plan (as shown in Table 3.7-8) and the 2017 Clean Air Plan. The project would be consistent with the goals and policies of the general plans and climate action plans of Marin County and Town of Ross. The impact would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.7-3: The project would not significantly alter air movement, moisture, or temperature, or cause any change in climate.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

The project would involve substantial changes to the Corte Madera Creek channel and banks, with the intent of reducing flood risk as well as improving fish passage, natural creek processes, and fish and riparian habitat. The project involves removal of up to 369 trees along the creek channel for construction of a riparian floodplain and installation of floodwalls to provide flood protection as well as removal of an existing concrete channel. The creek channel would be revegetated. These types of changes would result in short- and long-term alteration to the microclimate in the project area. In the short term, the removal of existing trees and vegetation is anticipated to result in an increase in localized temperatures due to the relationship between decreased canopy cover and increased temperatures (Ziter, Pedersen, Kucharik, & Tumer,

2019). However, a large segment of concrete channel would be removed, reducing the impervious surfaces in the area, reductions of which have been found to correlate to reduced temperatures. Additionally, as part of the project, new trees and vegetation would be planted on the project site, which would take approximately 10 years to grow to a size that would result in shading of the realigned concrete multi-use pathway. Although fewer trees may be planted than currently occur in the area under existing conditions, the reduction in concrete and replacement with vegetation would ensure that temperatures in the project area do not increase over the long term. The impact would be less than significant.

Mitigation: None required.

3.7.7 References

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3.8 Hazards and Hazardous Materials

3.8.1 Introduction

This section evaluates the potential for the project to result in adverse impacts related to hazards and hazardous materials. The analysis is based on review of available reports and maps of the project area and vicinity and on a discussion of potential project impacts and appropriate mitigation measures, as necessary.

3.8.2 Scoping Comments

Comments related to hazards and hazardous materials impacts were received during the public scoping process. These comments and the location where they are addressed in the hazards and hazardous materials analysis are provided in Table 3.8-1.

Table 3.8-1 Hazards and Hazardous Materials Scoping Comments

Agency/Entity	Comment	Location in Hazards and Hazardous Materials Section that Comment is Addressed
Town of Ross	Mechanisms and procedures to keep the public safe during high water events.	Section 3.8.7, Impact 3.8-4
Garril Page	The proposed side path, and steps to the creek invite access by the public. This creates dangerous conditions for unsuspecting people unaware that flows in the project area are forceful enough to transport an 18-inch boulder past the College of Marin into the downstream, natural channel. The unwary are not afraid of the creek: a Kentfield resident drowned in the channel. During flood conditions, small watercraft and surfboards are in use along Berens Drive and at the Bon Air Center.	Section 3.8.7, Impact 3.8-4
Garril Page	Where there are new flood walls, potential to trap people behind those walls with flood waters. Liability potentially increased by people being close to the creek.	Section 3.8.7, Impact 3.8-4
Barbara Salzman	This is a great project, and I think getting rid of the concrete wall would be an incredible benefit. Surprised about steps down to the creek. Do not like the idea of creek access. Not clear where that will be. Increases county liability and it isn't good for the resources.	Section 3.8.7, Impact 3.8-4
Elizabeth Robbins	Safety is a big problem with this project. Don't want people going into the creek during a storm. Dangerous creek when there is a lot of rain. Concerned about steps down to creek and not fencing off water. Puts people up close to rapidly flowing water.	Section 3.8.7, Impact 3.8-4
Pam	Hopes that the project will not remove fences at the back of the property in cement area so that people do not get pulled in during a flood. If someone falls in they will be dead – too fast moving and rapid water.	Section 3.8.7, Impact 3.8-4

3.8.3 Definitions

Hazardous Materials

Hazardous materials are chemical and non-chemical substances that can pose a threat to the environment or human health if misused or released. Explosives, flammable and combustible substances, poisons, radioactive materials, pesticides, petroleum products, and other materials under the Resource Conservation and Recovery Act (RCRA) in 40 Code of Federal Regulations (CFR) 261 are considered hazardous materials. These substances are most often released during motor vehicle or equipment accidents or chemical accidents during industrial use. Hazardous substances have the potential to leach into soils, surface water, and groundwater if they are not properly contained.

Wildland Fire

A wildland fire is any non-structure fire that occurs in vegetation or natural fuels. Wildland fires include prescribed burns and wildfires. Wildfire is defined as a wildland fire originating from an unplanned ignition, such as lightning, volcanos, unauthorized and accidental human-caused fires, and prescribed fires that are declared wildfires (National Wildfire Coordinating Group, 2018). A fire can burn exclusively along the forest floor, climb and consume the tree crown of an individual tree, or reach into and spread through the tree canopy.

Biotic and abiotic factors influence fires. Biotic factors that influence flammability of a forest include moisture content in the foliage; size and shape of leaves; retention of dead leaves and branches; spatial arrangement of flammable vegetation; and presence of flammable oils, resins, or other chemicals in leaves or branches. Shrubs and vines can act as fuel ladders, allowing a surface wildfire to travel up into the tree canopy. Dense forests with minimal horizontal separation between trees can spread flames more quickly (Doran, Randall, & Long, 2004).

Abiotic factors include climate (dry or humid), winds, weather conditions, and topography. Fire spreads more quickly during high-wind events and can also create their own wind patterns if they grow large enough. Fires in California are more likely to occur on hot, dry days most often in the summer or fall during periods of low precipitation. Slope, aspect, elevation, forest density, and large topographic features such as rock outcroppings influence fire spread; for example, fires tend to spread faster up a slope than down a slope.

3.8.4 Environmental Setting

Hazardous Materials and Sites

The presence of suspected contamination in and near the project area was identified using the SWRCB GeoTracker and the Department of Toxic Substances Control's (DTSC) EnvriroStor

database. Four sites were identified within 0.25 mile[1] of the project area in the database search (Table 3.8-2). All sites require no further action and are now closed.

Table 3.8-2 Hazardous Sites Within 0.25 Mile of Project Area

Site Name and Address	Approximate Distance and Direction from Project Area	Affected Medium	Site Type	Status
College of Marin – former gas station College Avenue and Sir Francis Drake Boulevard, Kentfield, CA 94904	900 feet northeast of the intersection of Units 2 and 3	Soil	EPA LUST cleanup site	Closed
College of Marin Kentfield Campus 835 College Avenue, Kentfield, CA 94904	870 feet west of the low channel concrete	Soil	EPA LUST cleanup site	Closed
PG&E Former Substation – Kentfield 925-929 Sir Francis Drake Boulevard, Kentfield	200 feet north of Unit 2	Soil	EPA cleanup program site	Closed
United Moving Inc 1023 Magnolia Avenue, Larkspur	900 feet southwest of Unit 2	Soil	EPA LUST cleanup site	Closed

LUST = Leaking Underground Storage Tank

Sources: (DTSC, 2020; SWRCB, 2020)

Schools

Schools located within 0.25 mile of the project area include the following:

- College of Marin, adjacent to Units 2 and 3
- Kent Middle School, adjacent to Unit 2
- Ross Elementary, west of Unit 4

Airports

The closest airports to the project area are Marin Ranch and San Rafael Airports, both located approximately 4 miles northeast of the project area.

[1] Analysis under CEQA requires assessment of whether a project would be located on a hazardous materials site, as defined under Gov. Code section 65962.5. A 0.25-mile buffer is a typical distance to use to identify the presence of contaminants in off-site groundwater that may have the potential to migrate to a given site. Off-site properties with groundwater contamination greater than 0.25 mile away are assessed to not have the potential to impact a given site. Off-site properties with soil contamination generally are only are dismissed from further consideration because soil contamination remains in place.

Emergency Response and Evacuation Plans

Marin County

Marin County maintains an Emergency Operations Plan that is intended to provide adequate preparation and agency response to natural or human-caused disasters that threaten the health or property of residents and businesses (Marin County , 2007). The plan describes how emergency management will be coordinated; identifies personnel responsibilities and actions necessary to protect health and safety, property, and the environment; and details procedures before, during, and after a major event.

Town of Ross

The Town of Ross Emergency Operations Plan addresses the planned response to extraordinary emergency situations associated with disaster affecting Ross. The plan establishes the emergency-management organization required to mitigate any significant emergency or disaster affecting Ross and the overall operational concepts associated with the Town of Ross Emergency Operations Center activities and recovery process (Town of Ross, 2013).

Wildfire

Wildland fires tend to be most common and severe during years of drought and occur on days of strong winds. With extensive urbanization of wildlands, these fires often involve destruction of suburban homes located in the wildland–urban intermix. The Town of Ross and Kentfield are listed as wildland–urban interface communities but are not within the very high fire hazard severity zones (VHFHSZ) (FIRESafe MARIN, 2020; CAL FIRE, 2008). Within the project area, Unit 4 represents the greatest risk of fire due to its dense vegetation and topography; however, no fires have occurred within Unit 4 in recent years (USACE, 2018).

3.8.5 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

Federal Regulations

Resource Conservation and Recovery Act of 1976, Toxic Substances Control Act of 1976, and Hazardous and Solid Waste Act of 1984

Implementation of the Resource Conservation and Recovery Act (RCRA) of 1976 and the Toxic Substances Control Act (TSCA) of 1976 resulted in the creation of a major federal hazardous-waste regulatory program that is administered by the United States Environmental Protection Agency (USEPA). The USEPA regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. Under the RCRA, a waste may be considered hazardous if it exhibits certain hazardous characteristics (ignitability, corrosivity, reactivity, or toxicity) or if it is included on a specific list of wastes that the USEPA has determined are hazardous. In accordance with the RCRA, any generator, transporter, or facility that treats, stores, or disposes of hazardous waste is required to ensure that the waste is properly managed from "cradle to grave" by complying with the federal waste-manifest system and other

regulations regarding hazardous waste identification, classification, generation, management and disposal.[2]

U.S. Department of Transportation Hazardous Materials Transport Act of 1974

The U.S. Department of Transportation (USDOT), in conjunction with the USEPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to transportation of hazardous materials. The Hazardous Materials Transportation Act of 1974 directs the U.S. Department of Transportation to establish criteria and regulations regarding the safe storage and transportation of hazardous materials. CFR 49, 171–180, regulates the transportation of hazardous materials, types of material defined as hazardous, and the marking of vehicles transporting hazardous materials.

Occupational Safety and Health Act of 1970

The Occupational Safety and Health Act (OSHA) was passed to address employee safety in the workplace. The act created the Occupational Safety and Health Administration (OSHA), whose mission is to ensure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. The OSHA staff establishes and enforces protective standards and reaches out to employers and employees through technical assistance and consultation programs. Some OSHA regulations contain standards related to hazardous materials handling, including workplace conditions, employee protections requirements, first aid, and fire protection. The regulations in 29 CFR et seq. include the following:

1. Part 1910.38 requires facilities to have an emergency action plan to ensure the safe response to emergencies.
2. Part 1910.119 contains requirements for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals that may result in toxic, fire, or explosion hazards.
3. Part 1910.1200 ensures that the hazards of all chemicals produced or imported are classified and that information concerning the classified hazards is transmitted to employers and employees. The transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, safety data sheets, and employee training.

State Regulations

Hazardous Materials Release Response Plans and Inventory Act

The Hazardous Materials Release Response Plans and Inventory Act of 1985, codified in Health and Safety Code, Sections 25500 et seq., also known as the Business Plan Act, requires

[2] Code of Federal Regulations, Title 40 – Protection of Environment, Parts 260-273.

businesses using hazardous materials of greater than 55 gallons of a liquid, 200 cubic feet of a gas, or 500 pounds of a solid to prepare a Hazardous Materials Business Plan (HMBP) that describes their facilities, inventories, emergency response plans, and training programs. HMBPs contain basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed of. This code and the related regulations in Title 19, California Code of Regulations (CCR), Sections 2620 et seq., require local governments to regulate local-business storage of hazardous materials in excess of certain quantities. The law also requires that entities storing hazardous materials be prepared to respond to releases. Those using and storing hazardous materials are required to submit a HMBP to their local Certified Unified Program Agency (CUPA) (see more below under the Unified Program) and to report releases to their CUPA and the State Office of Emergency Services. The California Office of Emergency Services is responsible for implementing the accident prevention and emergency response programs established under the Act and implementing regulations.

Hazardous Waste Control Act

The Hazardous Waste Control Act of 1972, codified in Health and Safety Code Sections 25100 et seq., created the State hazardous-waste management program, which is similar to but more stringent than the federal RCRA program. The Act is implemented by regulations contained in CCR Title 26, which describes the following required aspects for the proper management of hazardous waste: identification and classification; generation and transportation; design and permitting of recycling treatment, storage and disposal facilities; operation of facilities and staff training; and closure of facilities and liability requirements. These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the Hazardous Waste Control Act and Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with DTSC.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program), codified in Health and Safety Code Sections 25404 et seq., requires the administrative consolidation of six hazardous materials and waste programs under one agency, a CUPA. The Unified Program is implemented at the local government level by CUPAs. Most CUPAs have been established as a function of a local environmental health or fire department. The Marin County Department of Public Works is the CUPA for all of Marin County, including the Town of Ross and unincorporated Kentfield. Most of the previously described regulations are under the jurisdiction of the Marin County CUPA.

California Occupational Safety and Health Act

The California Occupational Safety and Health Act of 1973, codified in the California Labor Code, Sections 6300 et seq., addresses California employee working conditions, enables the enforcement of workplace standards, and provides for advancements in the field of occupational health and safety. The act also created the California Occupational Safety and Health Administration (Cal/OSHA), the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. Cal/OSHA's standards are generally more

stringent than federal regulations. Under Cal/OSHA standards, the employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (Title 8, CCR, Sections 337– 340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

Regional and Local Regulations

Marin County Municipal Code
Marin County Municipal Code establishes the following requirements related to hazardous materials that are applicable to the project.

Chapter 23.18, Stormwater Runoff Pollution Prevention (County of Marin Stormwater Runoff Pollution Prevention Ordinance)

> **Section 23.18.055 – Coordination with hazardous materials inventory and response program.** The first revision of the business plan for any facility subject to County Code Chapter 7.90 (Hazardous Materials Release Response Plans and Inventories) shall include a program for compliance with this chapter, including the prohibitions on illicit discharges, and the requirement to reduce stormwater pollutants to the maximum extent practicable.
>
> **Section 23.18.060 – Discharge of pollutants.** The discharge of material other than stormwater to a county storm drain or to an ASBS is prohibited. All discharges of material other than stormwater must be in compliance with a NPDES permit issued for the discharge.

Marin Countywide Plan
The following goals and policies in the Marin Countywide Plan are relevant to the project (Marin County , 2007).

Public Safety
Goal PS-4: Decreased Exposure to Hazardous Materials. Reduce the risks to human and environmental health from hazardous materials.

> ***Policy PS-4.1: Regulate and Reduce Hazardous Material Use.*** Control the use and storage of hazardous materials to minimize their presence in, and potential dangers to, the community and environment.
>
> > *Implementing Program PS-4.b: Regulate Hazardous Material Use*. Identify businesses that use, store, dispose of, or transport hazardous materials, and require them to follow measures that protect public health and safety.

Town of Ross General Plan

The following policies of the Ross General Plan related to hazards and hazardous materials are applicable to the project (Town of Ross, 2007).

Goal 5. Protecting Community Health and Safety and Preparing for Emergencies.

> **5.11 Hazardous Materials Storage and Disposal.** Require the proper use, storage, and disposal of hazardous materials to prevent leakage, contamination, potential explosions, fires or the escape of harmful gases, and to prevent individually innocuous materials from combining to form hazardous substances, especially at the time of disposal.
>
> **5.12 Access for Emergency Vehicles**. New construction shall be denied unless designed to provide adequate access for emergency vehicles, particularly firefighting equipment.

Town of Ross Municipal Code

The following codes of the Town of Ross Municipal Code related to hazards and hazardous materials are applicable to the project (Town of Ross, 2020).

Chapter 18.41 Design Review

> **18.41.100 Design Review Criteria and Standards.** (k) Health and Safety. Project design should minimize the potential for loss of life, injury or damage to property due to natural and other hazards. New construction must, at a minimum, adhere to the fire safety standards in the Building and Fire Code and use measures such as fire-preventive site design, landscaping and building materials, and fire-suppression techniques and resources. Development on hillside areas should adhere to the wildland urban interface building standards in Chapter 7A of the California Building Code. New development in areas of geologic hazard must not be endangered by nor contribute to hazardous conditions on the site or on adjoining properties.

3.8.6 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project could have a significant impact if it 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 one-quarter mile 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. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area;
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

Given the specific location and design of the project, impacts are analyzed in this section relative to the following additional threshold:

h. Create any health hazard or potential health hazard, expose people to existing sources of potential health hazards, or result in unsafe conditions for employees, visitors, or students.

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to hazards and hazardous materials for the project. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.8.7 Impact Discussion

Impacts Avoided

Due to the nature of the project, there would be no impacts related to the following criteria; therefore, no impact discussion is provided for the reasons described below:

1. **Criterion (d):** As discussed in the Environmental Setting above, four hazardous materials sites are located within 0.25 mile of the project area. All sites have been cleaned up and determined to be closed. There are no other known hazardous, toxic, or radioactive waste sites or activities within or near the project area. As a result, the project would not be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and would not create a significant hazard to the public or the environment.
2. **Criterion (e):** There are no airports or airstrips within 2 miles of the project area. Therefore, there would be no impacts related to proximity to airports.
3. **Criterion (g):** The project area is located within wildland–urban interface communities but is not within the very high fire-hazard severity zones (refer to Section 3.16 for discussion related to wildfire). The project is located within the creek corridor in areas that are routinely flooded. The purpose of the project is to

reduce the frequency and severity of flooding and to protect human life and properties in the communities of Ross and Kentfield. The project would not increase fire hazards to the surrounding areas. Therefore, there would be no impact related to increased risk of wildland fires.

Impacts Analyzed

Impact 3.8-1: The project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or reasonably foreseeable upset or accident conditions involving the release of hazardous materials into the environment, including, but not limited to oils, pesticides, chemicals, or radiation.	Significance Determination
	Construction: Less than Significant
	Operation and Maintenance: Less than Significant

Construction

Project construction activities would involve the use of heavy equipment and vehicles. Petroleum products, such as gasoline, diesel fuel, oil, lubricants, and cleaning solvents would be used to fuel and maintain construction vehicles and equipment for construction of all project elements. Minor maintenance activities and refueling of equipment and vehicles from fuel trucks could occur at the staging areas during construction. If not properly managed, the routine transport, use, and disposal of hazardous materials could pose a threat to human health or the environment. For example, hazardous materials have the potential to be spilled accidentally during maintenance, refueling, or servicing of equipment and vehicles.

Construction activities are required to comply with numerous hazardous materials and stormwater regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety, to reduce the potential for a release of construction-related fuels or other hazardous materials to affect stormwater and downstream receiving water bodies, and to respond to accidental spills, if any. Workers handling hazardous materials are required to adhere to OSHA and Cal/OSHA health and safety requirements. Hazardous materials must be transported to and from the project area in accordance with RCRA and USDOT regulations, managed in accordance with the Marin County Department of Public Works CUPA program, and disposed of in accordance with RCRA at a facility that is permitted to accept that waste. Although a spill or leak of hazardous materials is unlikely, because of the project's location in Corte Madera Creek, a spill or leak has the potential to contaminate the waterway. As discussed in Section 3.9 Hydrology and Water Quality, construction contractors would be required to prepare a SWPPP for construction activities according to the NPDES General Construction Permit requirements and similar related County and Town regulations. The SWPPP would list the hazardous materials (including petroleum products) proposed for use during construction and demolition and describe spill response and control measures, equipment inspections, equipment storage, and protocols for responding immediately to spills. With implementation of the SWPPP and compliance with existing regulations, the potential impact related to routine transport and accidental releases of hazardous materials would be less than significant.

Operation and Maintenance

Operation and maintenance activities would generally be similar to existing conditions except for operation of the proposed pump station and testing of the new backup generator. These activities would require occasional site visits using vehicles and construction equipment that would use fuel and oil. Similar to the use of equipment during construction activities described above, the contractor and the District would be required to comply with numerous hazardous materials and stormwater regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety, to reduce the potential for a release of construction-related fuels or other hazardous materials to affect stormwater and downstream receiving water bodies, and to respond to accidental spills, if any. With compliance with existing regulations, the potential impact would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.8-2: The project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Construction

Emissions

Project construction equipment emissions would emit toxic air contaminants (TACs) within 0.25 mile of three schools. Refer to Section 3.2 Air Quality for an analysis of TAC emissions generated during construction and potential impacts on sensitive receptors, including schools.

Materials Handling

As discussed in Impact 3.8-1, project construction would involve the routine use of petroleum products, such as gasoline, diesel fuel, oil, lubricants, and cleaning solvents to fuel and maintain construction vehicles and equipment. Equipment and vehicle maintenance and refueling, as well as use of hazardous materials, could occur within 0.25 mile of a school. With the exception of equipment fuel, which would likely be stored in a large-capacity fuel truck, the quantities of hazardous materials that could be spilled would be small. This would limit their ability to be transported to a school site because small quantities would be quickly absorbed into the soil and would cease to have an effect. In addition, workers handling hazardous materials are required to adhere to OSHA and Cal/OSHA health and safety requirements. Hazardous materials must be transported to and from the project area in accordance with RCRA and USDOT regulations limiting potential risk of exposure during transport. The impact from materials handling within 0.25 mile of a school would be less than significant.

Waste Handling

All waste would be disposed of in accordance with all applicable federal, state, and local laws regarding soil and hazardous waste disposal and would be transported off site to a licensed landfill. No contaminated soils are known to occur in the area; therefore, the project would not expose schools to any contaminated soils and the impact would be less than significant.

Operation and Maintenance

Operation and maintenance activities would generally be similar to existing conditions except for operation of the proposed pump station and testing of the new backup generator. These activities would require occasional site visits using vehicles and construction equipment that would use fuel and oil. The construction contractor(s) and the District would be required to comply with numerous hazardous materials regulations designed to reduce the potential for a release of hazardous material that would affect schools and to respond to accidental spills, if any. Through compliance with existing regulations, the potential impact from exposure of schools to hazardous materials would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.8-3: The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Construction

Marin County maintains an Emergency Operations Plan that provides information for emergency management, personnel responsibilities, and procedure before, during, and after major event. The Ross Emergency Operations Plan serves as a planning reference and as a basis for effective response to any hazard that threatens Town of Ross. No roads in the project vicinity have been designated as emergency evacuation routes. Sir Francis Drake Boulevard would provide the main access from Highway 101 to all of the project work sites. Sir Francis Drake Boulevard is a main emergency or evacuation route for communities in West Marin (Marin County , 2019). No road closures would occur during construction, except for the temporary closure of one lane on College Avenue for up to two days and temporary closure of a segment at the end of Laurel Avenue. Vehicles would be able to travel on College Avenue during the short-term closure of College Avenue and would be able to travel around the work area at the end of Laurel Avenue to access the College of Marin or evacuate from the College of Marin. The project would not affect implementation of an emergency operation plan, emergency response plan, or an emergency evacuation plan for Marin County or the Town of Ross. The impact would be less than significant. Impacts on emergency access are analyzed further in Section 3.13 Transportation and Circulation, under Impact 3.13-4.

Operation and Maintenance

Operation and maintenance activities would generally be similar to existing conditions except for operation of the proposed pump station and testing of the new backup generator for up to 50 hours per year. Upon completion of construction activities, occasional maintenance vehicles would access the project area. However, the vehicles would be parked off of streets, and no lane closures would be required. The project would not impair implementation of or physically interfere with any adopted emergency response plan or emergency evacuation plan. No impacts would occur.

Mitigation: None required.

	Significance Determination
Impact 3.8-4: The project would not create any health hazard or potential health hazard, expose people to existing sources of potential health hazards, or result in unsafe conditions for employees, visitors, or students.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Construction, Operation, and Maintenance

The project would involve park improvements within Frederick Allen Park, including construction of a new pedestrian path and tree planting adjacent to the path to shade the realigned pathway. The pathway would gently lower in grade along this newly realigned length from the tennis courts to the park entrance. From the low point in the pathway, boulders would provide areas for seating and access to the natural creek channel. The new access to the natural creek could potentially create a hazard by bringing people into greater contact with the creek, especially during rain events. The lower elevation of the pathway and location of the pathway within the floodwall would also result in increased risk of floodwaters occurring on the pathway as compared with existing conditions. The project would also remove the chain-link fencing along with the floodwalls from the edge of the park and residential yards opposite the park. Removal of the fencing, which acts as a physical barrier separating people from the creek, could expose people or structures to a significant risk of loss, injury, or death from flooding. The threat of flooding is an existing problem in the project area. Removal of chain-link fencing and relocation of the floodwall to the outside of the public access area within the park, lowering of the bike path, and creating a new access point to the creek could potentially expose people to increased risk and hazards and unsafe conditions from flooding in the project area.

The District has proposed the following measures and procedures to reduce the risk of public hazards from flooding in Frederick Allen Park:

- A spit-rail fence will be added along the length of the new top of the channel in Frederick Allen Park during the vegetation establishment period. The split rail fence will create a physical barrier between the new realigned Bike Route 20 pathway and the creek and could remain following the vegetation establishment period if desired by the Town of Ross.
- The District would close access from the pathway to the natural creek prior to predicted major storm events to prevent people entering the creek.
- Signs would be posted at the access points to Frederick Allen Park, notifying the public about the risk of flooding.

In addition, the Town of Ross Public Works Department currently implements procedures in the area to prevent access to public areas immediately prior to and during flooding. These procedures include posting A-frame signs to notify the public that the area is closed due to flooding. The Town of Ross Public Works Department would close access along Bike Route 20 through the park at the entrance from the Post Office parking lot, the entrance from Ross Common, and the entrance near the tennis courts. Through installation of fencing, blocking access to the creek prior to flooding, blocking access to Frederick Allen Park prior to flooding,

and public education about flood hazards, the project would not create a substantial hazard or substantially expose employees, visitor, or students to unsafe conditions. The impact would be less than significant.

Mitigation: None required.

3.8.8 References

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3.9 Hydrology and Water Quality

3.9.1 Introduction

This section describes existing hydrology and water quality in the project area, including wastewater and stormwater management, existing and future flooding, groundwater conditions, and the existing regulatory framework governing these topics. Potential hydrology and water quality impacts that could result from construction and operation of the project and mitigation measures to avoid or reduce significant adverse impacts are then discussed, as appropriate.

3.9.2 Scoping Comments

Comments related to hydrology and water quality impacts were received during the public scoping process. These comments and the location where they are addressed in the hydrology and water quality analysis are provided in Table 3.9-1.

Table 3.9-1 Hydrology and Water Quality Scoping Comments

Agency/ Entity	Comment	Location in Hydrology and Water Quality Section that Comment is Addressed
Leslie and J. Bradley O'Connell	Removal of the concrete channel in Ross, which has functioned well, will expose some homes on Sir Francis Drake to the prospect of greater flooding. Will the County or Town of Ross be responsible for these damages? The County's model as to the reduction in flooding does nothing to address the flooding caused by overland or runoff water. It is acknowledged as a problem in the previous EIR draft, but no specific approaches were suggested. The FAP flood wall design has not taken into account the possible introduction of increased flooding caused by overland water or creek overflow water trapped behind the walls. Project would introduce the possibility of greater harm during floods, greater harm to fish and trees, and greater risk throughout the year for families and homes becoming more vulnerable to flooding.	Impact 3.9-5
Garril Page	The project team has not performed an interior drainage analysis to determine if there is need.	Impact 3.9-5
Garril Page	The Oct 2018 EIR/IS predicted increased flooding downstream of Ross and specifically in the College of Marin area. By removing the channel walls in the lower Unit 2 channel, approximately the areas extending from Stations 332+00 to 320+00, increases the potential for toxic waste entering the natural creek habitat. The College of Marin's dumping facility, a.k.a. trash transfer station, has	Impact 3.9-1 Impact 3.9-3 Impact 3.9-5

Agency/ Entity	Comment	Location in Hydrology and Water Quality Section that Comment is Addressed
	been a source of protest and concern. The facility is wrapped within the channel's curve. Lowering walls, and widening banks destabilizes existing conditions and increases potential encroachment of flood waters into this COM facility.	
Garril Page	The cumulative effect of removing San Anselmo's Azalea, Madrone, Nokomis, Center/ Sycamore and Ross' Winship bridges, plus removal of the fish ladder constraint, is to increase downstream flood flows. This increases potential flooding at the trash transfer station, spilling toxic waste into the surrounding habitat.	Chapter 2 Project Description Impact 3.9-5
Garril Page	The EIR/EIS states Alt J induces more frequent flooding downstream of Ross at, for example, the College of Marin per Appendix A sections 7.1,7.5.6, 8.2, 9.1 and in Areas of Controversy #5 above. Induced flooding is a significant adverse consequence, an added risk, and must be identified as such.	Impact 3.9-5
Garril Page	The proposed FAP Riparian Corridor lies within a watershed unique due to the quantity of sediment shed into its waterways. Prior projects repeatedly have miscalculated the effects of erosion and aggregation, and also have used incorrect, challenged Mannings 'n' values with resultant flawed concepts, dysfunction, and failed performance.	3.9.5 Impact Assessment Methodology
Garril Page	Partial consideration wherein only certain aspects and areas of the channel are included in studies and reports ensures continued failure: Winship Bridge to Lagunitas Bridge must be included the proposed project.	3.9.5 Impact Assessment Methodology
Garril Page	Adding 11 -17 new larger fish resting pools to the channel bottom has unknown effect on flow, sediment transport and sedimentation. Since formulas used to model proposals are limited by data uncertainty, odds of selecting correct assumption(s) essential to determining the appropriate computer programming lessen exponentially with additional unquantified designs.	3.9.5 Impact Assessment Methodology Impact 3.9-5 Impact 3.9-6
Garril Page	The new larger fish resting pools in the channel bottom creates unknown effect on the existing concrete structure's stability, coefficient of roughness, profile at the time of any given flood event. Therefore, reliable, accurate predictions of potential turbulence and other hydraulic effects become less likely.	3.9.5 Impact Assessment Methodology Impact 3.9-5 Impact 3.9-6
Samantha Hobart	Advise each property owner where the flood elevations are before and after any creek work is completed. Be able to	Impact 3.9-2

Agency/ Entity	Comment	Location in Hydrology and Water Quality Section that Comment is Addressed
	discuss changes to individual's properties and not only a select few property owners like with the San Anselmo Flood Risk Reduction Project. Provide a Fish Ladder removal-only alternative. The root systems of the mature trees in Frederick Allen Park are an integral part of flood prevention and protection; removing these trees and their root systems will cause significant damage and increased risk to flooding and the erosion.	Impact 3.9-5 See also Chapter 5 Alternatives
Doug Ryan	What does the model being used show as the water level and flood levels before the San Anselmo Creek project and after? Does the impact of the Winship Bridge replacement have a similar effect on the houses downstream in the scope of this project and how is this accounted for? Why is so-called beautification being included as part of a flood control project? Resources are scarce and should be focused on flood control and nothing else. What does the beautification project do to reduce flooding?	Impact 3.9-5
Charles Goodman	The County is using the Army Corps EIR/EIS Plan J Bypass as the basis for their own EIR/EIS. This is flawed because the County has left out all of the residents of Sylvan Lane and Shady Lane from hydraulics and hydrology.	3.9.5 Impact Assessment Methodology, Impact 3.9-5
Charles Goodman	They have failed to account for any overload water flows from Bolinas Avenue, Fernhill, Southwood, Norwood, Ames or Lagunitas Road.	3.9.5 Impact Assessment Methodology
Charles Goodman	The EIR/EIS must address the significant impact on reducing the flow through Fred Allen Park, from supercritical flow to a 10-25 year level of Flood Protection (per comment from Liz Lewis, at the July 9, 2020 Ross Town Council Meeting). The number of 10-25 year is baseless and has not been verified by the County.	3.9.5 Impact Assessment Methodology
Charles Goodman	"The County must address sediment removal. (""This study's uncalibrated sediment budget estimates that the Corte Madera Creek Watershed supplies about 7,250 tons of bedload each year to the reach above Ross. The calibrated Parker-Klingerman sediment transport model estimated average bedload sediment inflow at Ross is about 6,750 tons/year. Using an average of the two results, the study estimates that about 7,000 tons/year of bed load are delivered to Ross, or about 450 tons/sq. mi. /year."") Source: Geomorphic Assessment of the Corte Madera Creek Watershed, final report. To remove 7,000 sediment at 20 tons per truck= 350 trucks (loads). Load 6 trucks per hour, (1 every 10 minutes) equals 58 hours or over 7 works days for	Impact 3.9-2

Agency/ Entity	Comment	Location in Hydrology and Water Quality Section that Comment is Addressed
	removal. How does the County plan to mitigate this substantial disruption of removing sediment from the Town?"	
California State Lands Commission	"Sea-Level Rise: A tremendous amount of State-owned lands and resources under the Commission's jurisdiction will be impacted by rising sea levels. Because of their nature and location, these lands and resources are already vulnerable to a range of natural events, such as storms and extreme high tides. The State of California released the 2018 Update to the Safeguarding California Plan in January 2018 to provide policy guidance for state decision-makers as part of continuing efforts to prepare for climate risks. The Safeguarding Plan sets forth "actions needed" to safeguard ocean and coastal ecosystems and resources as part of its policy recommendations for state decision-makers. In addition, Governor Brown issued Executive Order B-30-15 in April 2015, which directs state government to fully implement the Safeguarding Plan and factor in climate change preparedness in planning and decision making. Commission staff believes the goals of the proposed Project are consistent with the guidance and recommendations presented in the Safeguarding Plan, and that Project would benefit coastal management agencies' efforts to plan for more resilient shorelines and minimize adverse ecosystem impacts resulting from sea-level rise. Please note that when considering lease applications, Commission staff will (1) request information from applicants concerning the potential effects of sea-level rise on their proposed projects, (2) if applicable, require applicants to indicate how they plan to address sea-level rise and what adaptation strategies are planned during the projected life of their projects, and (3) where appropriate, recommend project modifications that would eliminate or reduce potentially adverse impacts from sea-level rise, including adverse impacts on public access. Therefore, this information should be included in the Draft EIR."	3.9.5 Impact Assessment Methodology
CDFW	The State of California Sea-Level Rise Guidance/2018 Update (California Natural Resources Agency, 2018) provides a science-based methodology for state and local governments to analyze and assess the risks associated with sea-level rise and incorporate sea-level rise into their planning, permitting, and investment decisions. The Marin Shoreline Sea Level Rise Vulnerability Assessment/Bay Waterfront Adaptation & Vulnerability Evaluation (BayWAVE) (Marin County, 2017) provides context and	3.9.3 Environmental Setting – Sea Level Rise; 3.9.5 Approach to Impact Analysis

Agency/ Entity	Comment	Location in Hydrology and Water Quality Section that Comment is Addressed
	estimates of the physical and fiscal impacts across the County's bayside shoreline over the coming decades. It includes sea level rise scenarios ranging from 10 inches in the near-term (15 years) to 20 inches in the medium-term (mid-century) and to 60 inches in the long-term (end of century). Since the purpose of the Project is to reduce long-term flood risk, and a portion of this downstream channel is tidal, CDFW recommends incorporating the long-term (end of century) scenarios for sea level rise, beyond the 15 year estimate, to fully evaluate Project impacts.	
Town of Ross	The EIR should identify all the potential CEQA impacts related to replacing the existing Park with the proposed floodplain park including the following information: – The impact of sediment buildup within the proposed floodplain and associated maintenance responsibilities – Mechanisms and procedures to keep the public safe during high water events.	Impact 3.9-2
Town of Ross	The EIR should illustrate the comparison of the 10-year and the 25-year flood risk reduction benefits under existing, existing with cumulative impacts, and proposed project conditions for all alternatives and including the "fish ladder only" alternative for the entire reach of Corte Madera Creek between San Anselmo and Kentfield and including all drainage tributaries within Ross.	Impact 3.9-5 Chapter 5 Alternatives
Marin Conservation League	Does the Project modeling and planning take into account the likelihood of greatly increased extreme storms and rainfall and how could these affect Project efficacy?	3.9.5 Impact Assessment Methodology
Marin Conservation League	What effect if any would the proposed Project have on sediment accumulation in the concrete channel and downstream in the natural channel bed?	Impact 3.9-2
Marin Conservation League	How do elements of the Project affect flood risk on Kent Avenue?	Impact 3.9-5
Marin Audubon Society	Guidelines of first finished floor as a mitigation measure for hydrology. Require a 1-foot margin of floor if District wishes to use first finished floor as a measure. Requests measure reflects first finished floor less 1-foot to protect the residents	3.9.5 Impact Assessment Methodology Impact 3.9-5
Marin Audubon Society	No mention of the over ground water and how that will be dealt with. The whole modeling has been so inconsistent as seen with the San Anselmo area, could be inaccurate. If you cause more flooding, who will be responsible?	3.9.5 Impact Assessment Methodology

Agency/ Entity	Comment	Location in Hydrology and Water Quality Section that Comment is Addressed
Marin Audubon Society	Concerned about hydraulics and design of the project. When you have larger fish resting pools, it changes the way the water and the sediment moves in the channel.	Impact 3.9-2, Impact 3.9-5
Marin Audubon Society	In the watershed there is local drainage and a large source of flooding in Ross. Not considering the watershed, because not considering any local drainage.	3.9.5 Impact Assessment Methodology
Marin Audubon Society	Would like to see some specifics, what is the regrading of the fish ladder? How much regrading? Regrading affects the function; the function affects the hydraulics, and the hydraulics affects the results.	Project Description, 2.5 Project Elements and Design; Impact 3.9-2, Impact 3.9-5
Marin Audubon Society	Don't agree with the calculations of volume coming out of the creek – new Lagunitas Bridge will not handle that water. Water comes out at Lagunitas and Sylvan Lane and will flood all houses on Poplar. Homes not protected by project. Continually will not address the interior drainage that has no way of getting back into the concrete channel.	3.9.5 Impact Assessment Methodology Impact 3.9-5
Marin Audubon Society	Talk about sediment dynamics, want an explanation of what sediment dynamics consists of.	3.9.3 Erosion and Sedimentation
Marin Audubon Society	Modeling seems to be inaccurate and/or changing and people need to be aware there could be changes that may impact them negatively.	3.9.5 Impact Assessment Methodology

3.9.3 Environmental Setting

Corte Madera Creek Watershed Creeks and Drainage

Corte Madera Creek is in the Corte Madera Creek watershed (also referred to as the Ross Valley watershed) located in central eastern Marin County. The total watershed contains approximately 44 linear miles of stream channels and has a total land area of approximately 28.6 square miles, including portions of unincorporated Marin County and the towns of Corte Madera, Ross, San Anselmo, and Fairfax. The drainage basin extends approximately 8 miles on a northwest-southeast axis and averages approximately 3 miles in width. Elevations within the basin range from sea level at San Francisco Bay to 2,600 feet above mean sea level (msl) at Mount Tamalpais. Fifty percent of the basin lies below elevation 300 feet msl and 90 percent below elevation 1,000 feet msl. Streambed slopes range from 0 feet per mile in the lower reach of Corte Madera Creek, along the USACE Corte Madera Creek Flood Control Project (USACE Project) Units 1, 2, and 3, up to 20 feet per mile in the upper portions of Corte Madera Creek (USACE, 1966).

Corte Madera Creek and San Anselmo Creek are perennial streams and form the mainstem waterway of the watershed. San Anselmo Creek and its tributaries drain the northwestern

portion of the watershed. Ross Creek and its tributaries drain the northern slope of Mount Tamalpais, joining San Anselmo Creek from the west in the central part of the watershed. Downstream of the confluence of Ross Creek and San Anselmo Creek, the mainstem channel is known as Corte Madera Creek, which continues through the project area (Figure 3.9-1). The project is located in USACE Project Units 2, 3, and 4 within a portion of Corte Madera Creek that extends from just upstream of Lagunitas Road Bridge to approximately 500 feet downstream of Stadium Avenue. Approximately 18.1 square miles, or 63.3 percent of the total watershed area is tributary to the project area.

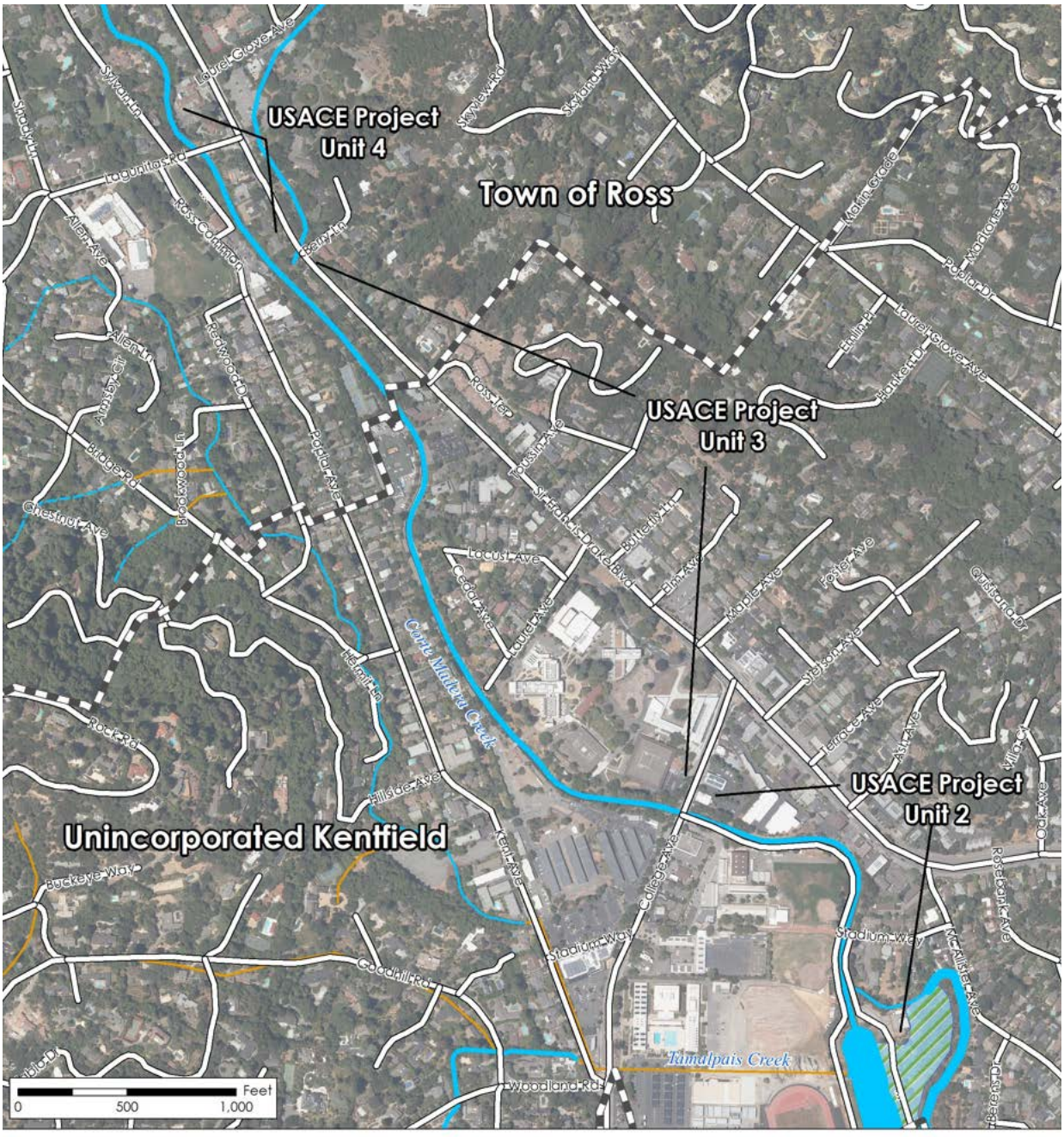
Hydrology and Geomorphology of the Corte Madera Creek Watershed

Marin County is characterized as having a temperate Mediterranean climate, with heavy rain in the winter and warm, arid summers. Eighty-three percent of the precipitation occurs during the months of November through March with less than 1 percent occurring from June through September (USACE, 1966; USACE, 2000a). Coastal fog is most common in summer, when it provides a minor source of precipitation, which is accentuated through leaf drip. Mean annual precipitation for the project area is 48 inches per year (WRCC, 2020). Snowfall is rare within the watershed and has no significant effect on flood peaks.

The upper parts of the watershed are hilly and mostly wooded (USACE, 2000a). The lower ridges and valley areas of the watershed are highly developed suburban residential and commercial areas. Development in the communities of Fairfax, San Anselmo, Ross, Kentfield, Larkspur, and Greenbrae has increased the area of impervious surfaces within the watershed, decreasing the amount of rainfall that can infiltrate into the soil. These changes in urban hydrology result in more runoff and higher peak flows than those which would occur under natural conditions (Royston 1977, in (USACE, 2010)).

Major runoff events occur during the rainy winter and spring seasons. Floods attributable to Corte Madera Creek are generally flashy and of short duration, whereby the creek water surface level rises quickly with the peak of the storm event and then recedes soon after. Flashy runoff patterns in the Ross Valley result from intense rainfall, the shape and steepness of the upper watershed surrounding the valley, and the lack of significant detention and infiltration in the urbanized valley. Tributaries rise rapidly so that flooding can begin a few hours after the occurrence of heavy rainfall (FEMA 2009a, in (USACE, 2010)). Streamflow peaks may occur generally within 3 to 5 hours after periods of intense rainfall and recede within 24 hours after the end of such storms (USACE, 1966). Historical accounts indicate that major storms occurred in 1951, 1960, 1966, 1982–1983, 1986, and 2005 (USACE, 1966; FEMA 2009a, in (USACE, 2010); Stetson 2009, 2011, 2007, in (USACE, 2010)). During the summer months and dry years, there is little rainfall-runoff inflow to Corte Madera Creek, but the creek is supported by baseflow and aquifer storage.

Figure 3.9-1 Corte Madera Creek – Waterbodies in Project Vicinity



Sources: (USGS 2020, USFWS 2020) (US Geological Survey 2013, U.S. Geological Survey 2016, Tele Atlas North America, Inc. 2020, Bay Area Open Space Council 2011)

Corte Madera Creek has a natural channel bottom through Unit 4 of the project area and is concrete lined through Unit 3 and portions of Unit 2, a distance of over 1 mile. At the terminus of the concrete-lined segment, the creek opens to an earthen channel and is joined by Larkspur and Tamalpais creeks before flowing into San Francisco Bay at the Corte Madera Marsh State Marine Park.

The District maintains a rainfall gage in Kentfield. Stage data at the Corte Madera Creek Ross Gage (Site ID: 5255) is published by the District. The United States Geological Survey (USGS) also maintains a stream gage on Corte Madera Creek in Ross (11460000).

Storm Drainage System

The municipal storm drainage system for the Town of Ross and unincorporated Kentfield area collects overland flow from stormwater runoff in storm drains. The runoff is piped under roads or in rights-of-way and outfalls into Corte Madera Creek. More than 10 existing outfalls are located within Units 2, 3, and 4 as shown in Section 3.15 Utilities and Service Systems, Figures 3.15-1 through 3.15-3. The pipe outfalls range from 18 to 72 inches in diameter and enter from both sides of the channel. For Corte Madera Creek watershed, overland flooding is caused by inadequate channel capacity and poor drainage in areas close to the stream (FEMA 2009a, in (USACE, 2010)).

There are two mechanisms for overland flow and flooding in the watershed. The first mechanism is when stormwater runoff collects from drainage areas throughout the watershed, route through the municipal storm drain system, then discharge to Corte Madera Creek. During this process, when the downstream storm drain system has inadequate capacity, the conveyance creates a backwater effect and stormwater either ponds and/or sheetflows overland in the drainage areas. The second mechanism is when Corte Madera Creek does not have sufficient capacity to convey collected stormwater runoff from the municipal storm drain system, the creek overtops and inundates the adjacent floodplain. The focus of this project is to address the second mechanism of overland flooding, which is due to capacity constraints at Corte Madera Creek.

Channel Morphology and Conveyance

Corte Madera Creek from Sir Francis Drake Boulevard to the Denil fish ladder (i.e., Unit 4) is primarily a natural channel with vegetated banks and a gravel bed. Structural elements include the bridge abutments at Lagunitas Road Bridge and retaining walls along much of Unit 4. The longitudinal slope of the channel is fairly consistent. The vertical drop from Sir Francis Drake Boulevard to the concrete-lined channel is 11.3 feet. The horizontal distance for this change is 4,050 feet, resulting in a slope of 0.28 percent. The land immediately adjacent to Corte Madera Creek generally appears flat but there is topographical variation that becomes important during flood stage (Royston 1977, in (USACE, 2010)).

From the confluence with Ross Creek downstream to the Lagunitas Road Bridge, the channel cross sections are fairly consistent. The channel is deeply incised 12 to 15 feet below the banks. The channel bottom is about 20 to 25 feet across. Banks along this section of Corte Madera Creek

range from 5:1 (horizontal: vertical) slope where concrete retaining walls are built (PWA, 2009a). The channel bed is characterized by 30- to 150-foot-long and 15- to 20-foot-wide lateral scour pool/riffle sequences with depths ranging from 0.5 to 1.5 feet average depth. Scour pools contain large woody debris, root wads, and substrate composed of small gravel, sand, and silt. The area has abundant shade (Rich, 2000). The Lagunitas Road Bridge was replaced in 2010 with a higher soffit that increased the creek capacity at the bridge crossing.

Downstream of the Lagunitas Road Bridge to the Denil fish ladder, the channel remains incised though the depth from the bank to channel bed begins to decrease (10 to 12 feet). The creek banks vary in steepness from a steep 2:1 vegetated slope to vertical retaining walls along the private properties at Sir Francis Drake Boulevard. The channel bed tapers from approximately 30 feet in width at the bridge to 15 feet in width at the downstream end of Unit 4. The channel bed is characterized by long (80 to 100 feet), shallow (from a few inches to about 1.5 feet average depth) alternating lateral scour pool and riffle sequences; riffles are very narrow (3 to 6 feet wide) and shallow. The low streamflows, riprap, and condition of the wooden retaining walls result in fairly stagnant pool areas. Riffle areas are extremely shallow. Substrate in the pool areas consists of sand, silt, and organic detritus; in the riffles, small gravel is the predominant substrate (Rich, 2000).

The creek channel, within and upstream of Unit 4, has considerable vegetation, primarily on the natural banks. This vegetation provides some protection to the underlying soil against erosion from water flowing in the creek. In addition, many homeowners have placed rock, timber, concrete and other materials on the creek banks to protect against scour and erosion (Royston 1977, in (USACE, 2010)). However, despite the vegetation and placed bank materials, the streambanks in Unit 4 are actively eroding along approximately 7,200 linear feet of bank. Royston (1977, in (USACE, 2010)) estimated that roughly 20 percent of the total length of bank would be subject to 1 foot of erosion per year.

In 1989 and 2000, soil conditions within Corte Madera Creek were evaluated (Copeland, 2000; Copeland & Thomas, Cortland, 1986). Streambed soils were found to be shallow with limited absorbing capacity. The basic purpose of the field survey was to determine where erosion problems might develop and to visually determine the types of soil exposed in the banks and in the creek bottom. Surveys indicated that generally the banks consist of clayey sands and sandy clays of relatively low plasticity. In the creek bottom, well-graded gravels were observed (Royston 1977, in (USACE, 2010)). Subsurface exploration near the town limits of Ross determined that the subsurface materials consist predominately of clays, sandy clays, and clayey sands. In general, the materials were firm or stiff except for the soft clay (Bay Mud) within Unit 2 (USACE, 1966).

Erosion and Sedimentation

Sediment dynamics refers to the process of erosion, transport and deposition of sediment in alluvial stream channels. Fluvial sediment processes are an important component of fluvial function; the fluvial process both creates the channel and floodplain form and transports nutrients and pollutants downstream. Sediment processes within a watershed are typically

divided into three classes: sediment generation zones (typically highest in the upper watershed), sediment transport zones (typically upper and mid watershed areas), and sediment deposition zones (typically in the lower watershed areas of the creek). These tendencies can vary highly across a watershed depending on geology, soils, historic land uses, and other factors.

Sediment originates in the steeper, upper watershed areas of Corte Madera Creek, and is transported to Units 2, 3, and 4. Sediment transported to and deposited in Corte Madera Creek affects the conveyance capacity of the channel. Sediment deposition has historically occurred in the creek at the Lagunitas Road Bridge and farther downstream in Units 1, 2, 3, and 4, including the concrete-lined channel (Copeland, 2000). Sediment deposition in the concrete-lined channel ranged from 0 feet at the Kentfield Hospital Bridge to 4.65 feet at the downstream end of the concrete channel in 2015 (Stetson, 2015).

Sediment yield from the upper watershed is high due to a combination of geology and historic land uses. Natural landslides and earth flows in the upper watershed areas also periodically overwhelm the creeks with large volumes of fine-grained sediment (Stetson, 2000). In the description of the Corte Madera Watershed in the Integrated Regional Water Management Plan Report (Marin County, 2013), two highly erosive subwatersheds were identified. The Sleepy Hollow Creek subwatershed is identified as contributing 26 percent of total coarse-grained bedload sediment (as compared to fine-grained suspended sediment) inflow at the Town of Ross. The most probable sources of sediment are identified as active hillslope processes (e.g., slumps/land sliding). The San Anselmo Creek subwatershed is described as contributing 29 percent of total coarse-grained bedload sediment inflow to the creek within the project area (Marin County, 2013).

Sediment deposition rates are high in Units 2 and lower Unit 3 of Corte Madera Creek because of the combined influence of low channel slope in the concrete-lined channel and tides. More gentle sloped channels, other things being equal, have less driving energy and stream velocities. Lower stream velocities together with the stream meeting an incoming tide makes sediment fallout of suspension or transport and deposit. Incoming sediment from Corte Madera Creek and San Francisco Bay is conveyed on incoming tides, adding to the sediment load.

After USACE construction of the lower portions (Units 1, 2, and 3) of the Corte Madera Creek Flood Control Project (CMCFCP) in the 1970's, the channel began to aggrade at rates much greater than anticipated and the District was unable to maintain the channel at its design depth. Nonetheless, the earthen channel section in Units 1 and 2 (i.e., downstream of the stilling basin) contained the 1 percent AEP flood event that occurred in December 2005 without overbank flow. In an attempt to restore the original channel design depth, Units 1 and 2 were dredged in 1986, and the stilling basin was dredged again in 1998. Unit 4 below Sir Francis Drake Boulevard, upstream of the concrete-lined channel, is also depositional, with the channel bed aggrading (Stetson, 2000).

Flooding

Overbank flooding in Ross Valley, such as in 1982 to 1983, and 2005, occurs when streamflows exceed the conveyance capacity of the Corte Madera Creek channel. Structures on the creeks constrain flow causing water levels to rise and when flows are great enough, they breach the main channel transmitting flow into overflow paths (PWA 2000, in (USACE, 2010)). The Denil fish ladder, in its current condition, is a primary flow constriction for Unit 4 reach and upstream that causes extensive overbank flooding along Corte Madera Creek. The Denil fish ladder is also a barrier to fish passage. Bridge constrictions and poorly designed residential streambank stabilization structures have also exacerbated flooding on this naturally flood-prone system (Stetson 2006).

The USACE has conducted numerous studies focused on evaluating the performance of Units 3 and 4 since 1971 (USACE, 1966, 1974a, 1974b, 1987a, 1987b, 1988, 2000a, 2000b; Stetson 2008, in (USACE, 2010; USACE, 2018)). These studies identified a hydraulic constraint through the transition from Unit 4 to Unit 3 created by the existing Denil fish ladder and the narrow channel condition on the east and west bank.

The USACE has prepared several studies to assess the hydrologic conditions at Corte Madera Creek, beginning with those described in Design Memorandum No. 1 (USACE, 1966). The standard project flood (SPF)[1] discharges were estimated to be 7,500 cubic feet per second (cfs) for Corte Madera Creek within the project area, based on a 3-day reference storm that occurred in Hollister, California in December 1955 (USACE, 1966; USACE, 1988). The SPF estimate did not provide for upstream storage and assumed that the Corte Madera Creek channel and tributaries were fully modified upstream to Fairfax. Due to local opposition, the USACE's 1960's era concrete flood control channel construction ceased at the Town of Ross upstream of Unit 3.

Immediately upstream of where concrete flood control work on the channel stopped, channel capacity in the section of Corte Madera Creek between Lagunitas Road Bridge and the concrete channel currently ranges from about 3,300 to 4,000 cfs based on recent observations of when flow levels exceeded channel capacity and went overbank. The left bank (north side of creek toward Sir Francis Drake Boulevard) downstream of Lagunitas Road Bridge was overtopped during the December 15, 2016, January 10, 2017, and February 7, 2017, storm events when the observed peak discharges at the Ross Gage were about 3,380, 3,690, and 3,710 cfs respectively (Stetson, 2017).

[1] The standard project flood is defined by USACE as that flood produced by the standard project storm which is the most critical storm on record within a region meteorologically homogeneous with the basin under study, or the most critical storm on record in adjacent regions that can be reliably transposed to the subject basin, occurring at a time when conditions for runoff are favorable.

Overbank and Floodplain Flow

Overbank flows on San Anselmo and Corte Madera Creeks have historically led to significant flooding in the towns of San Anselmo and Ross. Previous studies have been performed to assess the location and source of overbank flooding on these creeks (PWA 2009b; Stetson, 2011). The Ross Valley Capital Improvement Plan (CIP) study (Stetson, 2011) estimated that, with respect to flows exceeding 2,800 cfs, backwatering from the Madrone Avenue Bridge causes San Anselmo Creek to breach the right bank of the main channel at Nokomis Avenue. The diverted flow then travels as split flow through San Anselmo and rejoins the creek corridor near its confluence with Ross Creek. Additional overbank flow caused by backwater buildup at the Sycamore Avenue Bridge contributes to the overbank flow generated at Nokomis Avenue. In the Ross Valley CIP study (Stetson, 2011), it was estimated that split flow at Sycamore Avenue Bridge is likely to occur at flows exceeding 3,100 cfs at that location. Overbank flows originating near downtown San Anselmo run down San Anselmo Avenue and along Shady Lane in Ross where they join with overflow occurring upstream of Lagunitas Road Bridge. The combined floodwaters flow through Ross Commons and down Poplar Avenue in Ross and Kent Avenue in Kentfield before finally returning to the concrete-lined channel downstream of College Avenue in Kentfield.

Within Unit 4, a split flow condition has historically been exacerbated by backwater buildup at Lagunitas Road Bridge. The Lagunitas Road Bridge was replaced in 2010, which increased the flood capacity of the channel. With the current Lagunitas Road Bridge, a split flow is estimated to occur at flows exceeding 3,630 cfs where flows exit the creek channel and contribute to flooding in Ross and Kentfield (Stetson, 2017). The Lagunitas Road replacement bridge was designed to convey about 5,400 cfs before the water surface reaches the bridge soffit.

Historical Flooding

Corte Madera Creek has flooded numerous times over the past 70 years. Floods causing major damage occurred in 1951, 1955, 1960, and 1966 (pre-project), and 1982–1983, 1986, and 2005 (post-project) (USACE, 1966; FEMA 2009a, in (USACE, 2010)); Stetson 2007, 2009, 2011, and 2017). Before the initiation of the federal project (CMCFCP), in 1969, the most severe flood for which measurements were obtained occurred in December 1955 (FEMA 2009a, in (USACE, 2010)). This flood had an estimated maximum discharge of about 5,500 cfs at the U.S. Geological Survey (USGS) Ross gauging station (Ross Gage). The peak discharge of 5,500 cfs for the water year 1956 flood was estimated by interpolation based on the FEMA's flood frequency curve and FEMA's estimate of 1956 flood as a 4 percent AEP flood (FEMA). The USGS database shows that the water year 1956 flood had a peak discharge of 3,620 cfs at the Ross Gage, which did not account for out-of-channel flow (Stetson, 2007). Since the federal project was built, more severe floods occurred in 1982 and 2005. The January 3 to 5, 1982 storm produced the largest recorded flood flow at the Ross Gage. The runoff resulted from a 32-hour rainstorm that became stationary and produced a continuous downpour that averaged about ¾ inch per hour for six hours. Most of the rain gages overflowed during the storm, so reliable statistics were unavailable, though part of the basin had more than 15 inches of rainfall. The storm produced a peak flow at the Ross Gage estimated at 7,200 cfs with an estimated recurrence interval greater

than 100 years (USACE, 2000a; USACE, 2000b). The flood inundated all of the low areas of the watershed, causing considerable damage in San Anselmo, Ross, Kentfield, and Larkspur. The December 31, 2005, storm produced the second largest recorded flood flow. The December 31, 2005 flood was estimated to be about 6,800 cfs at the Ross Gage, which included in-channel flow and out-of-channel flow (Stetson, 2007).

In 1953, the District Flood Zone 9 was created and in 1969 the USACE began construction of the flood control project that included Units 1, 2, and 3. Construction at the downstream end created a trapezoidal earthen channel and, further upstream, a concrete-lined channel part way through the Town of Ross. In 1982, up to 5 feet of flood water caused considerable damage in San Anselmo, Ross, Kentfield, and Larkspur. On January 1, 2006, flooding caused over $70 million in damage when the creek overtopped the banks and destroyed properties in San Anselmo and nearby communities (District, 2000; Friends of Corte Madera Creek, 2004; FEMA 2009a, in (USACE, 2010)). In response to the urgency created by this flood, the County of Marin authorized the development of the Ross Valley Flood Protection Program to respond to the concerns of business owners and residents in Ross Valley. The Ross Valley Flood Protection and Watershed Program utilizes a community-based participatory planning and design process that incorporates input from Ross Valley residents and stakeholders to help shape and implement solutions which significantly reduce local flood risk (District, 2020).

Flooding Near Project Elements

The threat of flooding is a significant problem in the project area. Several existing flood management focused documents ((USACE, 2010), (PWA, 2009b); (USACE, 2000a), (USACE, 2000b); Stetson 2006, 2009, 2011, 2007 and 2008, in (USACE, 2010) (USACE, 2018)) have evaluated flooding conditions in the project area. Historical flooding from Corte Madera Creek was primarily due to the relatively small capacity of the creek channel within Unit 4, the historical constriction of flow from the insufficient opening under the old Lagunitas Road Bridge, and backwater created from the transition into the concrete-lined Unit 3 channel and from the downstream inter-tidal mixing zone.

Historically, flows greater than about 3,200 cfs to 3,600 cfs overtopped Sylvan Lane upstream of the old Lagunitas Road Bridge. The current channel hydraulic capacity with the 2010 replaced Lagunitas Road Bridge in place is estimated to be about 3,630 cfs at the most constrictive location of the channel (Stetson, 2017).

Flood Hazard Areas

Following development of the SPF, several flood frequency analysis methods were used to study Corte Madera Creek stream flow data collected at the Ross Gage. A 1999 flood frequency analysis, conducted by the USACE, relied on USGS streamflow measurements associated with the original 1951 rating curve (Stetson 2006). Over the subsequent four decades of monitoring the channel had aggraded nearly 4 feet (Stetson 2007, in (USACE, 2010)). The USGS did not update the rating curve until 1987 to account for the cross-sectional change at the gage due to the deposited sediment. These bed level changes were reported to have affected the accuracy of the historical measurements taken at the Ross Gage and the reliability of the USACE's 1999

flood frequency analysis and flood frequency curve (Stetson 2006). The study published an updated stage-discharge rating curve (low-flow range) for the gage based on field measurements of discharges at different creek stages. The rating curve for the Ross Gage was evaluated for its peak stage measurements at the gage to determine annual peak flow discharges after 1993. Using this data of annual peak discharges, a flood frequency analysis was conducted using the 1987 version of HEC-WRC[2] program (Dawdy 2006, in (USACE, 2010)). The 2006 analysis relied on 55 years of data (including the historic USGS data).

The USACE performed statistical analyses using HEC-SSP[3] to develop relationships between the magnitude of flood flow and probability of occurrence in any given year (USACE, 2008). The updated USACE analysis included 57 years of data and relied on the published USGS historical peak flow values. The minor differences between the results of the 2006 and 2008 analyses reflect datasets, model selection (Firth, 2010), and computed versus expected probability used in each study.

More recent flood frequency analysis was performed using HEC-flood frequency analysis, as described in Technical Memorandum No. 1 of the 2011 Ross Valley CIP study (Stetson, 2011), using historical annual peak discharges at the Ross Gage. The flood frequency analysis is shown in Figure 3.9-2. Table 3.9-2 presents the flood frequency analysis results for each of the published flood frequency analysis studies, as well as the published FEMA values, where available. The peak discharge estimates at the Ross Gage under existing conditions in the Stetson 2011 CIP Study (as shown in Table 3.9-2 below) were adopted for this EIR analysis in order to match the flood frequency data used by countywide flood management programs[4].

A 1977 report estimated the 1 percent AEP flood flows entering the project area to be 3,700 cfs from San Anselmo Creek, 900 cfs from Ross Creek, and a combined overland flow of 2,300 cfs for a total of 6,900 cfs (Royston 1977, (USACE, 2010). The USACE estimated that approximately 4,700 cfs remained in-channel and 2,500 cfs flowed out-of-channel during the 1982 flood (USACE, 2000a). This channel flow estimate corresponds to an approximate 10-year peak flood discharge.

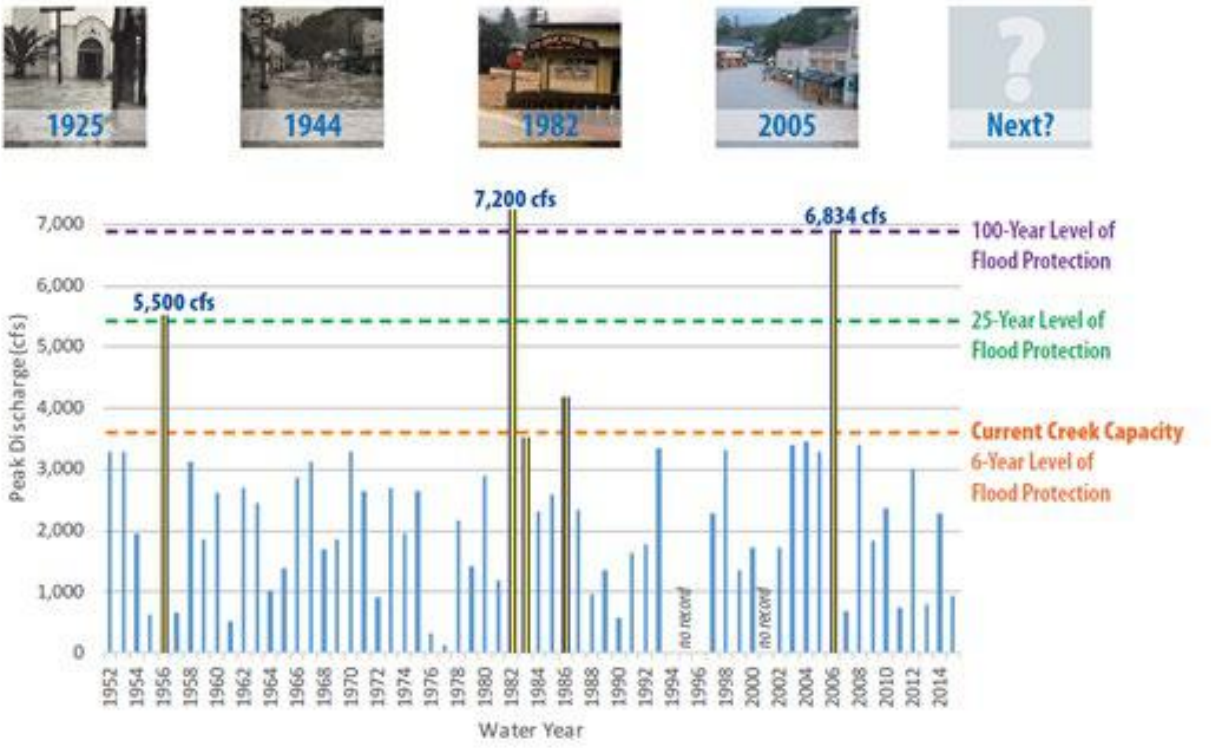
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[2] The HEC-WRC program has included several updates since its inception in 1978. The program is currently called HEC-flood frequency analysis which reflects techniques described in the revised, "Guidelines for Determining Flood Flow Frequency," Bulletin 17B, 1982.

[3] HEC-SSP is software developed by USACE to perform statistical analyses of hydrologic data. The current version of HEC-SSP can perform flood flow frequency analysis based on Bulletin 17B. The program can perform generalized frequency analysis on flow data and a volume-duration frequency analysis on high and low flows.

[4] The Stetson 2011 CIP Study used the available historical annual peak discharges up to 2010. At this time no attempt was made to update the FFA using the data collected since 2010. This way the 2018 EIS/EIR used the same flood frequency data as the countywide flood management programs. It would be expected that the flood frequency would have little change even if the data collected since 2010 were used. This is because no major floods have occurred since 2010.

Figure 3.9-2 Corte Madera Creek Historical Peak Annual Discharge



Source: (District, 2020)

The current (effective) Marin County Flood Insurance Study and countywide Flood Insurance Rate Map were issued on August 15, 2017 (FEMA, 2017). Peak discharge data were published for Corte Madera Creek in the effective Flood Insurance Study (FEMA, 2017).

Floodway and Tsunami Inundation Zones

Given that project construction involves work in or along the creek channel, the project area at least partially overlaps the regulatory floodway. A small portion of Unit 2, Lower Corte Madera Creek, is in the Tsunami Inundation Area (California Emergency Management Agency, 2009) (see Figure 3.9-3 below).

Groundwater

Groundwater and surface water are often hydraulically connected to some degree in natural streams. Surface water may infiltrate and become groundwater, or groundwater may discharge to the surface and become surface water. During the dry season, groundwater normally has cooler temperatures than the surface water flowing in the creek and, thus, groundwater discharge to the surface has a cooling effect, which makes the stream more suitable for cold freshwater habitat. While the project has primarily surface water components, information on groundwater hydrology has been included in this document as necessary to determine its relationship to surface water in the creek.

Table 3.9-2 Comparison of Peak Flood Discharges

	Dawdy, 2006 (cfs)	USACE, 2008 (cfs)	Stetson CIP, 2011 (cfs)	FEMA Flood Insurance Study 2009 (cfs)	FEMA Flood Insurance Study 2014 (cfs)	FEMA Flood Insurance Study 2017 (cfs)
2-year	2,130	2,106	2,130	—	—	—
5-year	3,630	3,620	3,490	—	—	—
10-year	4,520	4,555	4,370	4,060	3,871	4,060
20-year	5,280	5,368	5,180	—	—	
50-year	6,120	6,295	6,180	6,200	6,022	6,200
100-year	6,650	6,903	6,890	6,900	7,049	6,900
200-year	7,120	7,442	7,560	—	—	—
500-year	7,630	8,063	8,400	8,400	9,334	8,400

Notes:

[a] All peak flood discharges were calculated based on historical discharges at the Ross Gage (USACE, 1966).

[b] Results from the Stetson 2011 CIP Study were adopted for this analysis because they were recent and comprehensive.

[c] All analyses except the FEMA 2014 Flood Insurance Study used the Log-Pearson III Method to derive the peak flow estimates.

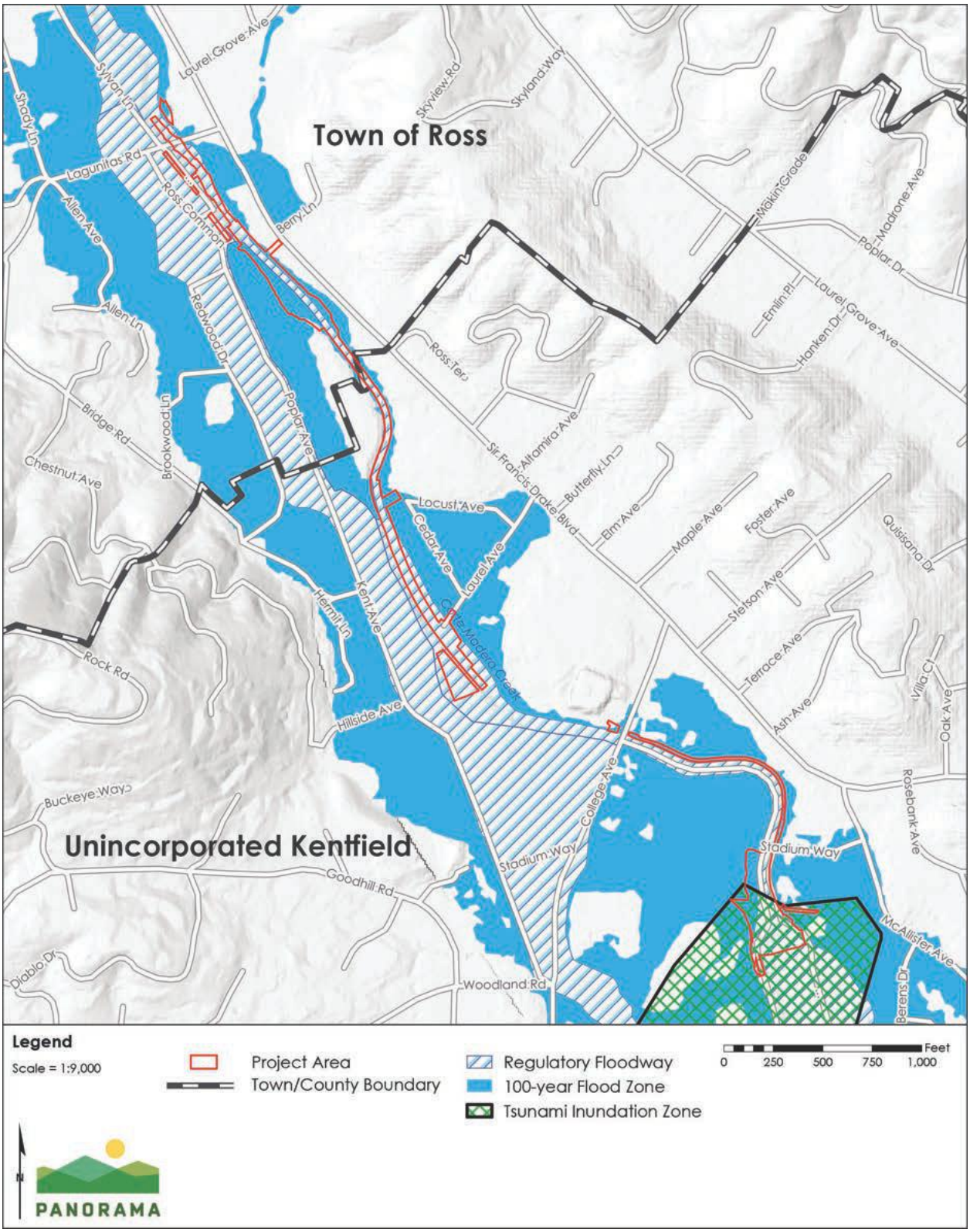
The FEMA 2014 Flood Insurance Study used a calibrated HEC-HMS model to simulate the peak flows for selected 24-hour design storms associated with the 10-, 2-, 1-, and 0.2-percent-annual-chance rainfall events (which are 6.03 inches, 8.09 inches, 9.0 inches, and 11.02 inches, respectively, in the HEC-HMS model; (PWA, 2009a)).

[d] Given that long-term historical annual peak flow records are available for the Ross Gage, use of the Log-Pearson III flood frequency analysis method based on historical annual peak flows is more reliable than 2014 FEMA's use of HEC-HMS hydrologic modeling based on selected 24-hour design storms. Rainfall-runoff modeling methods are normally used only for ungaged streams, not for gaged streams with long-term historical records of annual peak flows (FEMA, 2009b).

[e] The FEMA 2017 (effective) Flood Insurance Study directly used the results from the FEMA 2009 Flood Insurance Study. The peak flow estimates documented in the FEMA 2017 (effective) Flood Insurance Study are very close to those estimated by the Stetson 2011 CIP Study.

Source: (USACE, 2018)

Figure 3.9-3. Floodway and Tsunami Inundation Zones



Source: (GHD, 2020)

The Ross Valley groundwater basin underlies the downstream portion of Corte Madera Creek before its terminus at San Francisco Bay (SFBRWQCB, 2017). In the Project area, much of the Corte Madera Creek channel is concrete, which limits infiltration from the creek in the project area. Unit 4 is the only portion of the project area where creek infiltration can occur.

According to DWR, the project area is not located on a groundwater basin that produces, or has potential to produce, significant amounts of groundwater (DWR, 2019). While existing beneficial uses for the Ross Valley Groundwater Basin include municipal/domestic and agricultural water supply, and potential beneficial uses are industrial service water supply (without water quality limitations) and industrial process water supply (with water quality limitations) (SFBRWQCB, 2017), the groundwater basin is not a source of potable water and groundwater in Ross Valley is currently used only for landscape irrigation (Marin County 2005a). Examination of soil samples from borings and well data collected at the College of Marin from 2013 to 2015 indicates ground water level are expected to be 7.5 to 10.5 feet below the ground surface in the vicinity of the project area (Environmental Resource Group, Inc., 2013).

Additional groundwater basin characteristics were published in the Marin Countywide Plan (Marin County, 2007). The study found that the Ross Valley Groundwater Basin was located at a depth of 10 to 60 feet below ground surface. The basin's storage capacity was estimated at 1,380 acre-feet and covered an area of 18 square miles. The perennial safe yield was estimated at 350 acre-feet.

Tidal Influence

Corte Madera Creek is tidally influenced from the natural channel bottom brackish marsh in Unit 2 to approximately 400 feet downstream of the Kentfield Hospital bridge within the concrete-lined channel (Stillwater Sciences, 2020). Average tidal fluctuations in the concrete-lined channel range from 0.06 feet relative to the North American Vertical Datum of 1988 (NAVD88) at mean-lower low-water (MLLW) to 5.90 feet NAVD88 at mean-higher-high-water. The 1 percent AEP tide elevation is estimated to be 9.0 feet NAVD88 in the FEMA 2009 Flood Insurance Study. However, the FEMA 2017 Flood Insurance Study shows the 1 percent AEP tide elevation to be 9.7 feet NAVD88. An extreme high tide of 8.88 feet NAVD88 was measured during the January 27, 1983, coastal flood event at the San Francisco Bay tidal gage station (NOAA #9414290) over a period of record of more than 160 years dating back to 1855.

Sea Level Rise

Global sea levels are rising due to impacts from climate change and increased concentrations of atmospheric greenhouse gases. Both thermal expansion and melting land ice contribute to rising sea levels. Since Corte Madera Creek empties into San Francisco Bay and portions of the creek experience tidal effects, sea level rise will influence the hydrology of the creek. As sea level rises, tidal influences will increase in sections of the creek where they already occur, and tidal action will expand further upstream. Higher tides linked to sea level rise will also exacerbate flooding during major storm events. Estimates for sea level rise in the San Francisco Bay area vary greatly (Table 3.9-3) due to the complexity of, and uncertainty associated with, the

variables used in present models. The sea level rise projection used in modeling for the project is based on the estimated relative sea level change from 1992, the last National Tidal Datum Epoch (NTDE), to 2067 at the San Francisco NOAA Tidal Gage (Station ID: 9414290).

Table 3.9-3 San Francisco Bay Sea Level Rise Estimates

Year	Bay Wave	CNRA 2018	NRC 2012 Projection	NRC 2012 Range	USACE 2019 Low	USACE 2019 Int	USACE 2019 High
2030	10″	0.5 feet	5.7″ ± 2″	2″-12″	3″	4.6″	9.5″
2050	20″	1.1 feet	11″ ± 3.6″	5″-24″	4.6″	8.2″	19.6″
2070		1.9 feet			6.1″	12.7″	33.2″
2100	60″	3.4 feet	36″ ± 10″	17″-66″	8.5″	21.0″	60.5″

[a] Bay Wave and NRC values relative to year 2000 and USACE values relative to 1992.

[b] CNRA 2018 values based on 2000 baseline year.

[c] Project lifespan expected to be roughly 50 years.

[d] USACE 2019: Used USACE Sea Level Change Calculator (2017.55), San Francisco Gauge, NOAA 2006 SLC Rates.

Sources: (Marin County, 2020c; Council, 2012; Engineers, 2019; CNRA, 2018)

The USACE intermediate curve for relative sea level change was used to estimate the 1.0-foot coastal water level increase, between 1992 and 2067. With the mean higher-high water level of 6.65 feet at the San Francisco Gage, the estimated coastal water level in 2067 is 7.65 feet (USACE 2018).

In order to better understand the long-term post-project condition with projected sea level rise, an additional sea level rise scenario is considered in this EIR. The additional projection of sea level rise reflects the year 2100 planning horizon. The projection is based on the 2018 Update of the State of California Sea-Level Rise Guidance (CNRA, 2018), under the likely range of 66 percent probability sea-level rise estimate with a high emissions projection. The sea level rise projection is 3.4 feet, from the baseline year of 2000. With the existing mean higher high water level of 5.95 feet and the interannual variation of 0.7 feet, the estimated coastal water level in year 2100 under this scenario is 10.05 feet.

Water Quality

Corte Madera Creek has a number of tributaries that flow from open space headwater areas through urbanized areas to San Francisco Bay. The creek experiences a variety of water quality problems related to nonpoint-source pollution from urban runoff (4.1 miles of storm sewers), septic systems, road and bank erosion; specific concerns include pesticides, bacteria, particulates (sediment), and nutrients (Town of Ross 2009, CCA 2002, in (USACE, 2010)). The SFBRWQCB provides information on sediment, pathogens, and diazinon as pollutants of concern. Pathogens of concern are Enterococcus (in Corte Madera Creek), and E. coli (in the tributaries) (Friends 2006, in (USACE, 2010)). Nutrient loading from runoff and sewage

contribute to growth of algae and other aquatic plants in portions of Corte Madera Creek, particularly areas that are unshaded by riparian vegetation (Town of Ross 2009, in (USACE, 2010)).

Erosion originating primarily from headwater areas and, to a lesser extent, creek banks in the towns, result in increased sedimentation in the creeks (Stetson, 2000).

Marin County completed water quality testing in accordance with the Small MS4 General Stormwater Permit in 2016, including at one location along Corte Madera Creek (at Lagunitas Road Bridge). Constituents monitored included over one dozen pesticides (including diazinon); parameters also measured included organic carbon, suspended sediment, total dissolved solids, turbidity, water temperature, pH, electrical conductivity, and dissolved oxygen (MCSTOPPP and City of Petaluma, 2016). At the Lagunitas Road Bridge, diazinon was not detected during the three sampling events conducted, and dissolved oxygen concentrations met the water quality objective (MCSTOPPP and City of Petaluma, 2016).

Corte Madera Creek is on the USEPA-approved 303(d) List of Water Quality Limited Segments. Corte Madera Creek is tributary to the San Francisco Bay and the San Francisco Bay is also listed on the approved 303(d) list. Table 3.9-4 lists the beneficial uses and impairment status of water bodies in the project area, including the pollutants that cause the impairments. Once a water body is placed on the 303(d) List of Water Quality Limited Segments, it remains on the list until a Total Maximum Daily Load (TMDL) is adopted and the water quality standards are attained or there are sufficient data to demonstrate that water quality standards have been met and delisting should take place.

Corte Madera Creek is impaired for the pesticide diazinon, although this listing may be related to the overall impairment of the San Francisco Bay rather than specific measurements for diazinon within Corte Madera Creek. The SFBRWQCB 2005 plan amendment cites earlier data showing no detectable diazinon (less than 30 nanograms/liter) in water samples from Corte Madera Creek. A TMDL has been approved in the Basin Plan for all urban creeks to address the impairment (SFBRWQCB, 2017). An attainment strategy to achieve the TMDL has identified the sources of diazinon loading in the watershed and specified actions to address them; public participation has been important in setting effective and achievable TMDLs and attainment strategies (Marin County, 2005a; Marin County, 2007b) and will continue to be central to improving water quality.

High coliform bacteria counts have been detected during the winter months in various segments of the creek (Marshall et al. 1994, as cited in (Rich, 2000)). Friends of Corte Madera Creek Watershed (2006) found elevated levels of both E. coli and Enterococcus at several stations within Corte Madera Creek. Although the Friends of Corte Madera Creek Watershed (2006) study found Enterococcus counts to be highly variable, these counts periodically exceeded federal contact recreational criteria. Corte Madera Creek also exhibits high water temperatures. These increased temperatures have been attributed to urbanization of the watershed, specifically the reduction of shaded stream surface area due to loss of riparian

vegetation and increased channel width, although less so within Unit 4 (Friends 2008a, in (USACE, 2010). Measured water temperatures in the project area are high beginning in late May and extending through September, ranging from 65 to 75 degrees Fahrenheit (°F) (Rich, 2000), with higher temperatures being recorded within the concrete-lined sections of Corte Madera Creek. These higher temperatures are stressful for migrating salmonids, but thermal refugia may be available to fish either due to the presence of pockets with limited mixing, combined with daily temperature fluctuations, or the presence of deeper pools in areas of the creek which are not concrete-lined (Rich, 2000). Elevated water temperatures may also exacerbate existing problems with algae and aquatic plant growth (Town of Ross 2009, in (USACE, 2010)).

Table 3.9-4 Beneficial Uses and Impairment Status

Water Body	Beneficial Use(s)	Impairment Status	Pollutants
Corte Madera Creek	COMM, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2, NAV	303(d) List, Category 4a - Being addressed with USEPA approved TMDL	Diazinon
Ross Valley Groundwater Basin	Existing - MUN, AGR Potential – PRO, IND		
San Francisco Bay, Central	IND, PRO, COMM, SHELL, EST, MIGR, RARE, SPWN, WILD, REC-1, REC-2, NAV	303(d) List, Category 5	Chlordane, DDT, Dieldrin, Dioxin compounds, Furan compounds, Invasive Species, Mercury, PCBs, PCBs (dioxin-like), Selenium, and Trash

AGR – Agricultural Supply	RARE – Preservation of Rare and Endangered Species
COMM – Commercial and Sport Fishing,	SHELL – Shellfish Harvesting
COLD – Cold Freshwater Habitat	SPWN – Fish Spawning
EST - Estuarine Habitat	WARM – Warm Freshwater Habitat
IND - Industrial Service Suppl	WILD – Wildlife Habitat
MIGR - Fish Migration	REC-1 – Water Contact Recreation
MUN – Municipal and Domestic Supply	REC-2 – Noncontact Water Recreation
PRO – Industrial Process Supply	NAV – Navigation

Sources: (SWRCB, 2018), (DWR, 2019), (SFBRWQCB, 2017)

3.9.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project and are defined as standard conditions for the project.

Federal Regulations

Clean Water Act

Under the Clean Water Act (CWA) of 1977, the U.S. Environmental Protection Agency (USEPA) seeks to restore and maintain the chemical, physical, and biological integrity of the nation's

waters by implementing water quality regulations. Multiple sections of the CWA apply to activities near or within surface or ground water.

Section 404 of the CWA authorizes the U.S. Army Corps of Engineers (USACE) to regulate the discharge of dredged or fill material to waters of the U.S., including wetlands (33 U.S.C. Section 1344). The USACE issues site-specific individual or general (i.e., Nationwide) permits for such discharges.

Under Section 401 of the CWA, any applicant for a federal license or permit to conduct any activity that may result in any discharge into navigable waters must provide the licensing or permitting agency with a certification that the discharge would comply with the applicable CWA provisions (33 U.S.C. Section 1341). If a federal permit is required, such as a USACE Section 404 Nationwide Permit for dredge and fill discharges, the Project proponent must also obtain a Section 401 Water Quality Certification from the RWQCB.

Section 402(p) of the CWA regulates discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) Program, a nationwide surface water discharge permit program for municipal and industrial point sources. In California, NPDES permitting authority is delegated to and administered by the nine RWQCBs. Under Section 402, the SFBRWQCB has set standard conditions for each permittee in the Bay Area, including effluent limitation and monitoring programs. In addition to their responsibility to issue and enforce compliance with NPDES permits, the RWQCBs are responsible for preparation and revision of the relevant regional Water Quality Control Plan, also known as the Basin Plan (discussed further under State regulations).

Section 303(d) of the CWA requires that each State identify water bodies or segments of water bodies that are "impaired" (i.e., do not meet one or more of the water quality standards established by the State, even after point sources of pollution have been equipped with the minimum required levels of pollution control technology). USEPA must approve the 303(d) List before it is considered final. Inclusion of a water body on the Section 303(d) List of Impaired Water Bodies triggers development of a TMDL for that water body and a plan to control the associated pollutant/stressor on the list. The TMDL is the maximum amount of a pollutant/stressor that a water body can assimilate and still meet the water quality standards. Typically, a TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The Basin Plan is amended to legally establish the TMDL and to specify regulatory compliance, including specification of waste load allocations for entities that have permitted discharges.

Federal Antidegradation Policy

The federal Antidegradation Policy, established in 1968 under Section 303 of the Clean Water Act, is designed to protect existing uses and water quality and national water resources. Implementation of antidegradation by the states is based on a set of procedures to be followed when evaluating activities that may impact the quality of the waters of the U.S. Antidegradation

implementation is an integral component of a comprehensive approach to protecting and enhancing water quality of both surface water and groundwater.

Rivers and Harbors Act of 1899
The Rivers and Harbors Act of 1899, as amended and codified in 33 U.S.C. Section 408 provides that USACE may grant permission for another party to alter a Civil Works project upon a determination that the alteration proposed will not be injurious to the public interest and will not impair the usefulness of the Civil Works project.

National Flood Insurance Program
The FEMA determines flood elevations and floodplain boundaries based on USACE studies. FEMA also distributes the flood insurance rate maps used in the NFIP. These maps identify the locations of special flood hazard areas, including 100-year floodplains. Federal regulations governing development in a floodplain are set forth in Title 44, Part 60 of the Code of Federal Regulations. Those regulations enable FEMA to require municipalities participating in the NFIP to adopt certain flood hazard reduction standards for construction and development in 100-year floodplains. These standards are included below in Local Regulations.

The NFIP sometimes further divides the one percent annual chance floodplain on a river into a floodway and floodway fringe (FEMA, 2016). The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights (FEMA, 2016). The area between the floodway and the 100-year floodplain boundaries is termed the floodway fringe, which encompasses the portion of the floodplain that could be completely obstructed without increasing the water surface elevation (WSE) of the 100-year flood by more than 1 foot at any point (FEMA, 2016).

Pursuant to 44 CFR 60.3(d)(3), encroachments including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway are prohibited unless it has been demonstrated through hydrologic and hydraulic analyses that the encroachment would not result in any increase in flood levels. FEMA requires revisions to the Flood Insurance Rate Maps for encroachments into the floodway that cause base flood elevations to increase within the floodway. An application for a conditional letter of map revision must be filed with the Federal Insurance Administrator consistent with FEMA guidelines prior to floodway encroachment.

State Regulations

Porter-Cologne Water Quality Control Act
The State of California's Porter-Cologne Water Quality Control Act provides the basis for water quality regulation within California and assigns primary responsibility for the protection and enhancement of water quality to the California State Water Resources Control Board (SWRCB) and the nine RWQCBs. Under the Porter-Cologne Act, the SWRCB and RWQCBs also have the responsibility of granting CWA NPDES permits and Waste Discharge Requirements (WDRs) for certain point-source and non-point discharges to waters. The Porter-Cologne Act allows the

SWRCB to adopt statewide Water Quality Control Plans and Basin Water Quality Control Plans, which serve as the legal, technical, and programmatic basis of water quality regulation statewide or for a particular region. The water quality control plans limit impacts on water quality from a variety of sources. The Basin Plan for the San Francisco Bay and the relevant permits are described below.

San Francisco Bay Water Quality Control Plan (Basin Plan)
San Francisco Bay waters are under the jurisdiction of the SFBRWQCB, which established regulatory standards and objectives for water quality in the Bay in the Water Quality Control Plan for the San Francisco Bay Basin, commonly referred to as the Basin Plan. The Basin Plan identifies existing and potential beneficial uses for surface and ground waters and provides numerical and narrative water quality objectives designed to protect those uses. The preparation and adoption of water quality control plans is required by the California Water Code (Section 13240) and supported by the federal CWA. Because beneficial uses, together with their corresponding water quality objectives, can be defined pursuant to federal regulations as water quality standards, the Basin Plan is a regulatory reference for meeting the state and federal requirements for water quality control. Adoption or revision of surface water standards is subject to the approval of the USEPA.

NPDES General Permit and Waste Discharge Requirements for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (Order No. 2013-0001-DWQ)
In 2003, the SWRCB required small municipal storm drainage systems, including those in Marin, to be regulated under a statewide NPDES Small Municipal Separate Storm Sewer Systems (MS4s) General Permit. Areas that drain to separate stormwater collection systems, such as those within Marin County, were subject to this permit. The Marin County Stormwater Pollution Prevention Program (MCSTOPPP) Action Plan 2010 is the approved Storm Water Management Plan required under the 2003 MS4 permit. Each municipality complied with the 2003 MS4 permit by implementing Action Plan 2010 through a local stormwater program and through the collaborative efforts of MCSTOPPP (MCSTOPPP, 2013).

On February 5, 2013, the SWRCB adopted the General Permit for Waste Discharge Requirements for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems, Order No. 2013-001-DWQ (2013 MS4 permit; (SWRCB, 2013)). The 2013 MS4 permit modified the 2003 MS4 permit by establishing the storm water management program requirements in the Order and defining the minimum acceptable elements of the municipal storm water management program (SWRCB, 2013). The required program includes specific elements related to program management, education and outreach on stormwater impacts, public involvement/ participation, illicit discharge detection and elimination, construction site stormwater runoff and control, pollution prevention/good housekeeping for permittee operations, post-construction stormwater management for new development and redevelopment, water quality monitoring requirements, program effectiveness assessment, and annual reporting. For renewal permittees such as Marin County, Fairfax, Ross, and San Anselmo, the guidance document must identify and describe Best Management Practices (BMPs) included in their previous Stormwater Management Plan that may be more protective of water quality than the minimum

requirements of the updated permit, and identify whether the permittee proposes to maintain, reduce, or cease implementation of the BMPs.

NPDES General Permit for Discharges of Stormwater Associated with Construction Activities

The Construction General Permit (Order 2009-0009-DWQ, NPDES No. CAS000002; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ) regulates discharges of pollutants in stormwater associated with construction activity to waters of the U.S. from construction sites that disturb 1.0 or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface. The permit regulates stormwater discharges associated with construction or demolition activities, such as clearing and excavation; construction of buildings; and linear underground projects, including installation of water pipelines and other utility lines. This General Permit requires that storm water discharges and authorized non-storm water discharges must not contain pollutants that cause or contribute to an exceedance of any applicable water quality objective or water quality standards (identified in the Basin Plan).

The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes specific BMPs designed to prevent sediment and pollutants from contacting stormwater as well as non-storm water, and from moving offsite into receiving waters. The BMPs fall into several categories, including erosion control, sediment control, waste management and good housekeeping/site management practices. Routine inspection of all BMPs is required under the provisions of the Construction General Permit. In addition, the SWPPP is required to contain a visual monitoring program, a chemical monitoring program for non-visible pollutants, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

Receiving water risk is based on whether the project drains to a sediment-sensitive water body. A sediment-sensitive water body is one that appears on the most recent 303(d) list for water bodies as impaired for sediment, has a USEPA-approved TMDL implementation plan for sediment, or has the beneficial uses of cold freshwater habitat, fish migration, and fish spawning. As shown in Table 3.9-4, while none of the water bodies near or downstream of the project sites are listed as impaired for sediment or have a TMDL implementation plan for sediment, Corte Madera Creek has the beneficial uses of cold freshwater habitat, fish migration, and fish spawning and thus would be considered a sediment-sensitive water body under the Construction General Permit.

Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods, installing sediment barriers such as silt fence and fiber rolls, and maintaining equipment and vehicles used for construction. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations, vehicle and equipment washing and fueling. The Construction General Permit also sets post-construction standards (i.e., implementation of BMPs to reduce pollutants in stormwater discharges from the site following construction).

In addition to stormwater discharges, the Construction General Permit also covers other non-stormwater discharges including irrigation of vegetative erosion control measures, water to control dust, uncontaminated ground water from dewatering, and other discharges not subject to a separate general NPDES permit adopted by the Regional Water Board. The discharge of non-storm water is authorized under the following conditions:

1. The discharge does not cause or contribute to a violation of any water quality standard;
2. The discharge does not violate any other provision of the General Permit;
3. The discharge is not prohibited by the applicable Basin Plan;
4. The discharger has included and implemented specific BMPs required by the General Permit to prevent or reduce the contact of the non-storm water discharge with construction materials or equipment.
5. The discharge does not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;
6. The discharge is monitored and meets the applicable NALs; and
7. The discharger reports the sampling information in the Annual Report.

In the project area, the Construction General Permit is implemented and enforced by the San Francisco Bay RWQCB, which administers the stormwater permitting program. Dischargers are required to electronically submit a notice of intent (NOI) and permit registration documents (PRDs) in order to obtain coverage under this Construction General Permit. Dischargers are responsible for notifying the RWQCB of violations or incidents of non-compliance, as well as for submitting annual reports identifying deficiencies of the BMPs and how the deficiencies were corrected. The risk assessment and SWPPP must be prepared by a state Qualified SWPPP Developer and implementation of the SWPPP must be overseen by a state Qualified SWPPP Practitioner. A Legally Responsible Person, who is legally authorized to sign and certify PRDs, is responsible for obtaining coverage under the permit.

Waste Discharge Requirements and Water Quality Certification for Stream Maintenance Program

The Flood Control District has an existing Water Quality Certification (Clean Water Act Section 401) and Waste Discharge Requirements issued by the RWQCB to permit actions associated with its Stream Maintenance Program (SMP; SMP; Order No. R2-2017-0028). The SMP addresses actions necessary to continue providing flood protection and to maintain channel conveyance capacity while enhancing natural resources within subject streams. The routine management actions covered by this permit include sediment management, vegetation management, bank stabilization, and associated actions. This permit is renewed every 5 years, most recently in 2017. The details of the permit's terms and conditions come largely from the Marin County Stream Maintenance Program Manual, which can be revised as needed (subject to RWQCB approval) to add new streams or new activities. The five categories of maintenance actions covered are (1) vegetation management, (2) sediment and debris removal, (3) erosion control, (4) maintenance and repair of flood control structures, and (5) levee maintenance. These

activities can occur in flood control channels, natural channels, and other facilities on an as-needed basis.

The permit includes certain limits on the extents of channels and the volumes of material that can be addressed in a given year. Those limits are as follows:

1. Maximum length of maintenance within a concrete engineered flood control channels is 2,800 contiguous linear feet;
2. Maximum length of maintenance within an earthen engineered flood control channel is 800 contiguous linear feet;
3. Maximum length of maintenance within a natural channel is 600 contiguous linear feet;
4. Maximum volume of debris or sediment removed from any site is 2,100 cubic yards.

These activities may not exceed a program wide cumulative annual total of 5,000 linear feet of creek channel and 11,000 cubic yards of sediment and debris. Over the Order's 5-year term, these activities may not exceed a program wide cumulative total of 25,000 linear feet and 55,000 cubic yards of sediment and debris. Exceptions to these limits may be approved by the RWQCB on a case-by-case basis.

Lake and Streambed Alternation Agreement for Routine Maintenance Activities
The District has an existing Lake and Streambed Alteration Agreement issued by CDFW under California Fish and Game Code Section 1602. This agreement/permit covers several categories of actions that are implemented regularly for ongoing flood control purposes. These activities are (1) vegetation management, (2) sediment and debris removal, (3) erosion control, (4) maintenance and repair of flood control structures, and (5) levee maintenance. Under this permit, the District develops an annual work plan for the necessary activities and submits it to CDFW with follow-up reporting on those activities actually performed. This permit is renewed every 5 years, most recently in 2016.

Regional and Local Regulations

Marin County Stormwater Pollution Prevention Program (MCSTOPPP)
In 1993 MCSTOPPP was created to prevent stormwater pollution, protect and enhance water quality in creeks and wetlands, preserve beneficial uses of local waterways, and comply with State and federal regulations governing water quality. MCSTOPPP is composed of unincorporated Marin County, the Cities of Belvedere, Larkspur, Mill Valley, Novato, San Rafael, and Sausalito and the Towns of Corte Madera, Fairfax, Ross, San Anselmo, and Tiburon. The County's local stormwater program is responsible for implementing MCSTOPPP. The local stormwater program is administered by the Department of Public Works / County Flood Control Division staff in cooperation with the Community Development Agency, Environmental Health Services, and Parks and Open Space (Marin County, 2007b). Each MCSTOPPP member agency implements a local stormwater pollution prevention program and

funds the countywide MCSTOPPP, which provide for the coordination and consistency of approaches between the local stormwater programs.

MCSTOPPP acts as a separate implementing entity to meet 2013 MS4 permit obligations on behalf of all the municipalities and the County. Under the 2013 MS4 permit, the participating municipalities must implement best management practices for operations and maintenance activities, implement stormwater pollution prevention plans at corporation yards, document the amounts of litter removed, and provide an adequate number of litter receptacles in commercial and other litter source areas. Permit requirements are implemented by the County and staff from municipalities. Permit requirements also include operations and maintenance best management practices that municipalities apply to their own operations, public education and staff training, water quality monitoring, stormwater control ordinances, construction site controls, postconstruction stormwater program, TMDL compliance tasks, and annual reporting (Marin County, 2020a). Marin County and the Town of Ross have adopted local stormwater runoff pollution prevention ordinances, as described below, which include BMPs that would apply to the project.

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan are relevant to the project (Marin County, 2007a).

Water Resources

Goal WR-1: Healthy Watersheds. Achieve and maintain proper ecological functioning of watersheds, including sediment transport, groundwater recharge and filtration, biological processes, and natural flood mitigation, while ensuring high-quality water.

Goal WR-2: Clean Water. Ensure that surface and groundwater supplies are sufficiently unpolluted to support local natural communities, the health of the human population, and the viability of agriculture and other commercial uses.

> ***Policy WR-2.3 Avoid Erosion and Sedimentation***. Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and on-site sediment retention. Require developments to include on-site facilities for the retention of sediments, and, if necessary, require continued monitoring and maintenance of these facilities upon project completion.
>
> > *Implementing Program: WR-2.b Integrate Bay Area Stormwater Management Agencies Association (BASMAA) Stormwater Quality Protection Guidelines into Permitting Requirements for All Development and Construction Activities*. All projects should integrate stormwater pollution prevention design features for water quality protection to the extent feasible, such as those included in the BASMAA Start-at-the-Source manual and the Tools Handbook.

The above-listed goals, policies, and implementing programs are implemented in the Marin County Code Chapter on Stormwater Pollution Prevention, discussed further below.

Marin County Code
In accordance with federal and state regulations, Marin County has adopted water quality standards applicable to areas within unincorporated Marin County.

Marin County Code Chapter 23.18, Stormwater Runoff Pollution Prevention
The intent of the chapter is to protect and enhance the water quality of Marin County's watercourses, water bodies and wetlands in a manner pursuant to and consistent with the Clean Water Act, the Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.), and the Phase II Small Municipal Separate Storm Sewer System (MS4) NPDES Permit, Water Quality Order No. 2013-0001-DWQ, General Permit No. CAS000004 (phase II stormwater permit) and subsequent revisions and amendments thereto.

The discharge of material other than stormwater to a county storm drain is prohibited. All discharges of material other than stormwater must be in compliance with a NPDES permit issued for the discharge. (Section 28.18.061) Any person engaged in activities which will or may result in pollutants entering a county storm drain shall undertake all practicable measures to cease such activities and/or eliminate or reduce such pollutants. Such activities include, but are not limited to, ownership, operation and/or use of parking lots, gasoline stations, industrial facilities, commercial facilities, construction activities, and stores. However, some discharges that could be generated during construction, such as uncontaminated pumped groundwater, diverted stream flows, and flows from riparian habitats and wetlands are exempt from this discharge prohibition provided any pollutants in the discharges are identified and appropriate control measures to minimize the impacts of such discharges are developed and implemented.

In particular, Section 28.18.093 of the County Code requires implementation of construction-phase best management practices designed to protect water quality as follows:

> Any person performing construction activities in the county shall implement appropriate BMPs to prevent the discharge of construction wastes, including soil or sediment, or contaminants from construction materials, tools and equipment from entering a county storm drain, watercourse, bay or ocean. In addition:
>
> 1. Construction-phase BMPs include erosion and sediment controls and pollution prevention practices. Erosion control BMPs may include, but are not limited to, scheduling and timing of grading (soil disturbing) activities, timely revegetation of graded areas, the use of hydroseed and hydraulic mulches, and installation of erosion control blankets. Sediment control may include properly sized detention basins, dams, or filters to reduce entry of suspended sediment into the storm drain system and watercourses, and installation of construction entrances to prevent tracking of sediment onto adjacent streets. Pollution prevention practices may include designated washout areas or facilities, control of trash and recycled materials, covering

of materials stored onsite, and proper location of and maintenance of temporary sanitary facilities. The combination of BMPs used, and their execution in the field, must be customized to the site using up-to-date standards and practices. The agency will provide references to current guidance manuals and BMP information on request.

2. Erosion and sediment control plan requirements.
   a. An erosion and sediment control plan (ESCP) shall be required for:
      i. Any project subject to a grading permit under Chapter 23.08, Excavating, Grading and Filling.
      ii. Any project subject to a building permit or other permit issued by the County that the agency determines has the potential for significant erosion and/or significant non-stormwater discharges of sediment and/or construction site waste.
   b. The ESCP shall comply with County Code Section 24.04.625 and shall include information required in the most recent version of the MCSTOPPP ESCP applicant package.

In addition, Section 23.18.095 of the County Code requires watercourse protection as follows:

> Every person owning, occupying, leasing, renting, or in control of the premises through which a watercourse passes shall: (A) keep and maintain that part of the watercourse within the property reasonably free of trash, debris, excessive vegetation, and other obstacles which would and/or could pollute or contaminate the flow of water through the watercourse; (B) maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function or physical integrity of the watercourse; and (C) not remove healthy native bank vegetation beyond that actually necessary for said maintenance, nor remove any vegetation in such a manner as to increase the vulnerability of the watercourse to erosion. No person shall commit or cause to be committed any of the following acts, unless a written permit has first been obtained from the agency:
>
> 1. Discharge into a watercourse;
> 2. Modify the natural flow of water in a watercourse;
> 3. Deposit in or remove any material from a watercourse, including its banks, except as required for necessary maintenance;
> 4. Construct, alter, enlarge, connect to, change or remove any structure in a watercourse; or
> 5. Place any loose or unconsolidated material within a watercourse or so close to the side so as to cause a probability of such material being carried away by storm waters.

Town of Ross General Plan

The following policies of the Ross General Plan related to hydrology and water quality are applicable to the project (Town of Ross, 2007).

Goal 1. An Abundance of Green and Healthy Natural Systems

> **1.1 Protection of Environmental Resources**. Protect environmental resources, such as hillsides, ridgelines, creeks, drainage ways, trees and tree groves, threatened and endangered species habitat, riparian vegetation, cultural places, and other resources. These resources are unique in the planning area because of their scarcity, scientific value, aesthetic quality and cultural significance.

Goal 2. Sustainable Building and Community Practices.

> **2.2 Incorporation of Resource Conservation Measures**. To the extent consistent with other design considerations, public and private projects should be designed to be efficient and innovative in their use of materials, site construction, and water irrigation standards for new landscaping to minimize resource consumption, including energy and water.

Goal 6. Protecting Creek Habitat and Reducing Flooding Hazards

> **6.2 Flood Control Improvements**. The Town supports the construction of flood control improvements consistent with the natural environment, the design character of the Town of Ross and the safety and protection of persons and property.
>
> **6.3 Ross Valley Flood and Watershed Protection**. The Town will work with other jurisdictions within the Ross Valley watershed to develop a comprehensive approach to flood protection and resource preservation strategies.
>
> **6.4 Runoff and Drainage**. Stormwater runoff should be maintained in its natural path. Water should not be concentrated and flow onto adjacent property. Instead, runoff should be directed toward storm drains or, preferably to other areas where it can be retained, detained, and/or absorbed into the ground.
>
> **6.5 Permeable Surfaces**. To the greatest extent possible, development should use permeable surfaces and other techniques to minimize runoff into underground drain systems and to allow water to percolate into the ground. Landscaped areas should be designed to provide potential runoff absorption and infiltration.

Town of Ross Municipal Code

The following policies of the Ross Municipal Code related to hydrology and water quality are applicable to the project (Town of Ross, 2020).

> **6.12.040 General--Storage and disposal.** It is unlawful for any person to keep, deposit, bury, burn or dispose of any solid waste, except as in this chapter is provided, in or

upon any private property, public street, alley, sidewalk, gutter, park or upon the banks of or within any stream or creek in said town, or in or upon any of the waters thereof. Therefore, it is the intent of the town that every person residing or conducting business in this town shall dispose of solid waste only in the manner provided in this chapter. Nothing in this chapter shall prevent an owner and/or occupant of a residential or commercial premise from making occasional disposals at an authorized disposal site in addition to their regular weekly service, from utilizing a temporary debris box service, or from utilizing an employee or independent contractor to occasionally haul construction and/or demolition debris or for other occasional clean-up purposes consistent with Section 6.12.250. (Ord. 526 §1(part), 1994) (Town of Ross, 1994).

9.28.110 Refuse, trash and litter. It is unlawful for any person to dump, deposit, or leave any bottles, broken glass, ashes, paper, boxes, cans, dirt, rubbish, waste, garbage, or refuse, or other trash. No such refuse or trash shall be placed in any waters in or contiguous to any park or recreation area, or left anywhere on the grounds thereof, but shall be placed in proper receptables provided for such purpose. Where receptacles are not so provided, all such refuse or trash shall be carried away from the park or recreation area by the person responsible for its presence, and properly disposed of elsewhere. (Ord. 266 §2 (part), 1967: prior code §4710) (Town of Ross, n.d.)

13.12.170 Pollution of water channels. It is hereby declared to be a nuisance, and it is unlawful for any person to dump, put or place in, or on, or allow to run into, or on, any public reservoir, or the bank, border or margin, or into any water pipe, aqueduct, canal, stream, water, watercourse, or waterway within the town, any animal, vegetable, or mineral substance, or to do, perform or commit any act or thing which will pollute the purity and wholesomeness of any water or watercourse. (Ord. 496 §1(part), 1991) (Town of Ross, 1991).

13.16.010 Purpose. The free and unobstructed flow of each and every creek, channel or watercourse in the town is essential to the proper drainage of the town and to the protection of life and property therein. Any weeds, trees, bushes, shrubs, brush, undergrowth, debris, or rubbish of any character or description which, at any time, interferes with the free and unobstructed flow of water in any creek, channel or watercourse constitutes a public nuisance and is subject to summary abatement, and/or abatement in accordance with Chapter 9.04. (Ord. 309 §2(part), 1970) (Town of Ross, 1970).

3.9.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist), the project would have a significant impact if it 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 the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
    i. result in substantial erosion or siltation on- or off-site;
    ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
    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 hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation; or
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Given the nature of the project, impacts are analyzed in this section relative to the following additional threshold:

f. Expose people or property to flooding hazards

Approach to Impact Analysis

Overview

The following analysis discusses the potential impacts of the project related to changes in hydrology and water quality or other hydrology-related impacts in the project area. This section includes an analysis of potential short-term (construction) and long-term (operational) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are specified, as necessary, to reduce significant impacts.

Hydraulic Modeling

The floodplain analysis was completed based on the Ross Valley 1D/2D Unsteady-State Hydraulic Model ("Ross Valley Model" or "the model") jointly developed and calibrated by USACE and Stetson Engineers Inc. in 2017 and used in the previous USACE led EIR/EIS process for the Corte Madera Creek Flood Risk Management Project (USACE 2018). The floodplain analysis is designed to analyze creek hydraulic and floodplain overland flow due to creek overtopping.

The Ross Valley Model was developed in USACE HEC-RAS v5.0 modeling software, by upgrading and merging two separate and previously developed models: the Lower Corte Madera Creek Model and the Upper Corte Madera Creek Model. The model was calibrated and verified by first calibrating to observed and recorded streamflow conditions from the December 15, 2016 bankfull event by adjusting the in-channel parameters that were used in setting up the

model. The model was then calibrated to observed streamflows from the December 31, 2005 flood event by adjusting the floodplain parameters in the model. The model was also verified by comparing modelled results to actual flow conditions during the January 4, 1982 flood event. Calibration consisted of adjusting channel Manning's 'n', lateral weir flow coefficients, inline structure weir flow coefficients, or bridge/culvert modeling methods, all within reasonable ranges as specified in the HEC-RAS user's manual, until the model calculated WSEs matched the observed HWMs. The measured depths of sedimentation in the lower Unit 3 and Unit 2 concrete-lined channel were incorporated into the hydraulic modeling analysis as existing condition (USACE 2018).

Hydraulic models solve universally-accepted mathematical equations to simulate surface water movement across approximated topographic terrain. The solutions are approximations because a model cannot precisely quantify the spatially variable properties that exist in the real world. A reliable hydraulic model is one that can produce field-measured water levels and flow within an acceptable range of error. Error exists because information on the real-world system is always incomplete, and the field information that is available has associated errors (for example, measurement error). For all the three model calibration/verification events (i.e., December 15, 2016, December 31, 2005, and January 4, 1982), the differences between the model-simulated peak WSEs and the observed high water marks were well within the FEMA-required 0.5-foot range for most of the high water marks particularly at locations where high water marks were considered most reliable (see Appendix A of the U.S. Army Corps of Engineers Draft EIS/EIR (USACE, 2018)).

The following six scenarios were modeled:

1. Existing Condition Without Project
2. Existing Condition With Project
3. Future Condition Without Project
4. Future Condition With Project
5. Year 2100 Future Condition Without Project
6. Year 2100 Future Condition With Project

The existing condition without project reflects the current hydraulic conditions of Corte Madera Creek without construction of any planned or approved flood control projects. The existing condition with project reflects the existing condition model with all proposed project elements incorporated. The future condition without project reflects the hydraulic conditions of Corte Madera Creek with implementation of planned and/or approved projects listed in Table 3.9-5. The future condition without project scenario also includes an intermediate level of sea level rise for 2067, as described below. Both the San Anselmo Flood Risk Reduction Project (projects 1, 3, and 7 in the table below) and Winship Bridge Project (project 8) are expected to be implemented concurrent with construction of the proposed project, as discussed further in Section 4.3 Cumulative Impacts. The remaining projects in Table 3.9-5 are anticipated to be implemented within 5 years. The future condition with project reflects the future condition model with all proposed project elements incorporated into the model. The approach to

incorporating the project components into the model is described below. The Year 2100 future condition without project scenario includes all projects included in the future condition without project scenario and incorporates the CNRA predicted long-term sea level rise for year 2100. The future Year 2100 future condition with project scenario adds the proposed project elements to the Year 2100 future condition without project scenario.

Table 3.9-5 Projects Included in Future Condition Scenarios

No.	Project	Type	River/Creek	River Station (feet)
1	Sunnyside Nursery Site	New Detention Basin	Fairfax Creek	105+10
2	Azalea Avenue Bridge	Bridge Replacement		22+30
3	Building Bridge #2	Bridge Removal	Corte Madera Creek	434+52
4	Madrone Avenue Bridge	Bridge Replacement		449+49
5	Nokomis Avenue Bridge	Bridge Replacement		454+77
6	Sycamore Avenue/Center Boulevard Bridge	Bridge Replacement		440+05
7	Bridge Avenue Bridge	Bridge Replacement		438+00
8	Winship Avenue Bridge	Bridge Replacement		405+38

Sources: (USACE, 2018)

The existing condition without project and future condition without project scenarios were based on the Ross Valley Model developed in 2017. The existing condition with project, future condition with project, and Year 2100 future condition with project scenarios are developed as a part of this EIR analysis, based on the Ross Valley Model, with several revisions made specifically to the project components. The revisions include channel geometry updates to reflect the proposed project analyzed in the EIR, selection of hydraulic roughness, and updates to the Manning's 'n' factor to reflect the Frederick Allen Park floodplain improvements. The following adjustments were made to the model to reflect the post-project conditions:

- Unit 4
  - Cross section geometries were adjusted to reflect the proposed Unit 4 design concept, between Corte Madera Creek Stations 37051 and 36970
- Unit 3
  - Removal of the existing fish ladder inline structure and associated model cross sections
  - Cross section geometry adjustments to the cross sections representing the Frederick Allen Park project component concept design
  - Updated cross section Manning's "n" values along Frederick Allen Park project component to represent natural channel bottom and creek banks

  - Floodwall added along the left and right bank of Allen Park. The top of floodwall elevations were adjusted to a height of 1 foot above the 25-year design event WSE
  - Floodwall added on left bank adjacent to Granton Park, between Stations 35700 and 34500. The top of floodwall elevations were adjusted to a height of 1 foot above the 25-year design event WSE
  - Floodwall added to the left bank downstream of the College Avenue Bridge, between Stations 33476 and 32500. The top of floodwall elevations were adjusted to a height of 1 foot above the 25-year design event WSE
  - Short floodwall added on left overbank area upstream of College Avenue Bridge
  - Manning's "n" roughness coefficients adjusted in concrete channel to reflect the approximate roughness associated with the proposed fish pools
- Unit 2
  - Cross section geometries were adjusted to reflect the proposed Unit 2 design at the mouth of the concrete channel, between Stations 32291 and 31810

The existing condition without project, existing condition with project, future condition without project, future condition with project, Year 2100 future condition without project, and Year 2100 future condition with project scenarios was modeled for the following three flood recurrence intervals:

1. 10-year
2. 25-year
3. 100-year

Sea Level Rise

Sea level rise projections developed for the future condition without project and future condition with project analysis are based on procedures prescribed by Engineering Regulation (ER) 1100-2-8162, Incorporating Sea Level Change in Civil Works Programs (USACE, 2013). The geographically closest and most suitable NOAA tide gage for establishing relative sea level change (SLC) trends for the project area is the San Francisco, CA, NOAA tide gage, Station ID: 9414290. The San Francisco tide gage has a 110-year period of record and has been referenced to NAVD88. The USACE Sea-Level Change Curve Calculator's intermediate sea level change of about 1 foot (from 1992, the last NTDE, to 2067) was used in modeling of the future without project and future with project conditions. With the mean higher-high water level of 6.65 feet at the San Francisco Gage, the estimated coastal water level in 2067 is 7.65 feet (USACE 2018). An additional sea level rise scenario is included in the impact analysis to evaluate future conditions in year 2100, with projected sea level rise based on the 2018 Update of the State of California Sea-Level Rise Guidance (CNRA 2018), under the high emission likely scenario. The estimated coastal water level at 2100 is 10.05 feet. Additional information on how sea level rise was incorporated into the future condition modeling can be found in Appendix A of the U.S. Army Corps of Engineers Draft EIS/EIR (USACE, 2018)).

Erosion and Sediment Deposition

Impacts to sediment transport and potential resulting sedimentation or erosion were analyzed by evaluating changes in velocity, channel material, and channel cross-sectional area. Increases in velocity when "with project" scenarios are compared to "without project" scenarios, could indicate an increase in sediment transport capability as well as increased potential for scour or erosion, while potential future decreases in velocities relative to current conditions could facilitate sediment deposition and decrease the potential for erosion and scour.

Channel materials vary in terms of susceptibility to erosion, with earthen material being much less resistant than concrete. For earthen streambanks and the streambed, clay dominated sediment or soils tends to be more cohesive and less erosive than sand dominated sediment, but these sensitivities to erosion are also influenced by local site conditions as well as the hydraulic forces during streamflow. For earthen stream surfaces, the presence of vegetation or erosion controls can provide some protection to lessen the risk or effect of erosion. Changes and transitions in channel cross-sectional areas can influence sediment transport in alluvial channels (non-bedrock channels built into sediment that the creek formerly deposited). For the same discharge volume, a larger cross-sectional area results in lower streamflow velocity and potentially a more depositional environment and conversely a smaller cross-sectional area with the same discharge rate results in higher streamflow velocity and potentially a more erosive environment. In a transition where the channel widens, velocities lessen, and the tendency is for that transition to be more depositional. However, sometimes local eddy effects can create localized sideboard scour at the streambanks immediately downstream of the transition to a wider channel. Conversely, in a transition to a narrower channel, velocities will typically increase and the reach downstream of the narrowing transition can be more erosive or incisional.

Impact Analysis Methods

For this impact analysis baseline conditions and potential impacts were based on conditions at the time the Notice of Preparation (NOP) was published (August 2020). Impacts were also evaluated for future conditions that reflect sea level rise of 1 foot and implementation of the projects in Table 3.9-5 as described above. The approach to use of both an existing condition and future condition analysis is consistent with CEQA Guidelines Section 15125(a)(1). The future condition baseline is provided because the use of the existing conditions baseline at the time of the NOP alone would be misleading in that it does not include information for upstream projects that have been planned or approved and would be constructed in the near future (see Table 3.9-5) and sea level rise, which has been raised as a concern in public comments. These future projects would affect the baseline hydraulic conditions of Corte Madera Creek at the time or shortly after the proposed project becomes operational because the planned or approved future projects are located upstream on Corte Madera Creek and will affect the hydrology of Corte Madera Creeks as the planned and approved upstream projects have been designed to provide flood risk reduction to communities upstream of the project area. Sea level rise will affect the limits of high tide within Corte Madera Creek in the project area, which changes the future hydrologic conditions of the creek within the project area.

The impact analysis for floodplain inundation due to creek overtopping considers both the changes in velocity and WSE at the 10-year, 25-year, and 100-year recurrence interval under the existing conditions, and future conditions when the planned and approved upstream flood control projects have been constructed. The future condition scenario also addresses sea level rise as noted above. Because sea level rise will result in changes to the future environmental conditions that affects the hydraulic conditions in Corte Madera Creek, sea level rise has been incorporated into the future condition assessment to support the evaluation of project impacts on that future condition. Additional information on sea level rise can be found on the preceding page and in Appendix A of the U.S. Army Corps of Engineers Draft EIS/EIR (USACE, 2018).

Given limitations in model precision as discussed under hydraulic modeling above, a threshold of 0.2 feet (2.4 inches) was used for determining whether there was a potentially significant increase or decrease in WSE in the impact discussion below. The 0.2-foot threshold is a reasonable level of precision for evaluating flooding impacts considering the standards for accuracy and precision associated with a hydraulic model like the one used to evaluate the proposed project. During the project design process, the hydraulic model will be refined and updated to improve the accuracy in predicting the change in WSE.

3.9.6 Impact Discussion

Impacts Avoided

Due to the nature of the project, potential impacts to the criteria described below would not occur; therefore, further impact discussion is not provided as described below:

1. **Criterion (b):** The project would not utilize groundwater or generate an increase in impervious surfaces. Much of the channel in the project area is concrete allowing for little to no infiltration. The project may provide a slight increase in groundwater infiltration; however, the effect would be nominal since flows would likely be conveyed through the concrete portion of the channel most of the year and soils would already be saturated during flood events when the floodplain was activated.

Impact Analyzed

Impact 3.9-1: The project could violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality; or result in discharge of pollutants into surface or ground waters or other alteration of surface or ground water quality (e.g., temperature, dissolved oxygen or turbidity).	**Significance Determination**
	Construction: Less than Significant with Mitigation
	Operation and Maintenance: Less than Significant with Mitigation

Construction

Unit 4 Channel Improvements and Fish Ladder Removal (Town of Ross)

The proposed work in Unit 4 extends from approximately 150 feet upstream of the Lagunitas Road Bridge to Unit 3 at Frederick Allen Park. The improvements include the removal of the existing fish ladder, grading within the channel and banks to increase hydraulic capacity and

transition to the Allen Park improvements, and channel stabilization measures including planted rock, vegetated soil lifts, erosion control fabric, and engineered streambed material directly upstream of the removed fish ladder. Concrete will be installed at the transition to Unit 3. The improvements also include riprap and short cast-in-place concrete walls adjacent to existing concrete walls to reinforce those walls.

Removal of the fish ladder and grading the channel and banks would expose loose sediment and soils to precipitation, overland flows, and stream flows. The use of construction equipment in the channel has the potential for accidental release of petrochemicals and lubricants that could later spread following precipitation runoff or stream flows.

During construction, Unit 4 will be dewatered using a temporary diversion system to divert flows via pipe to the channel downstream of the work area (Appendix D). Channel stabilization measures including planted rock, vegetated soil lifts, erosion control fabric, engineered streambed material, concrete retaining walls, and a concrete apron where the fish ladder will be removed will be implemented to stabilize sediment and soils and help to prevent undesired erosion and sediment transport.

Compliance with the Construction General Permit, including preparation and implementation of the SWPPP and associated BMPs as well as inspection and reporting, would effectively reduce degradation of surface water quality to a less-than significant level. Adherence to these requirements would also effectively reduce potential impacts associated with spills or leaks of hazardous materials and stormwater quality during construction. Thus, construction of this element would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The impact would be less than significant.

Unit 3 Frederick Allen Park

The Frederick Allen Park improvements include removing the existing concrete-lined flood control channel, constructing new retaining walls adjacent to the transition from Unit 4, 2-foot-tall concrete flood walls on top of both banks, and excavating and grading the channel, streambanks, and floodplain to widen the channel and create a natural floodplain. The improvements also include revegetating the area with riparian species and new landscaping (see planting plans in Appendix B), realigning Bike Route 20 within the park, and creating new pedestrian access to the creek. The floodwalls are anticipated to be cast-in-place free-standing walls.

Removal of the concrete channel and excavation, tree removal, and grading within the channel and existing park would expose loose sediment and soils to precipitation, overland flows, and stream flows. The use of construction equipment in the channel has the potential to cause an accidental release of hazard materials that could later spread following precipitation, runoff, or stream flows.

During construction, upper Unit 3 will be dewatered from the location of the existing fish ladder to the Kentfield Hospital Bridge (freshwater reach of Corte Madera Creek). Slope and

channel stabilization measures including planted trees and shrubs, erosion control fabric, seeding, willow stakes, planted rock, retaining walls, concrete, and engineered streambed material will be installed to stabilize sediment and soils and help to prevent undesired erosion and sediment transport. Paving of the relocated Bike Route 20 multi-use pathway will also stabilize exposed soil in the project area.

Compliance with the Construction General Permit, including preparation and implementation of the SWPPP and associated BMPs as well as inspection and reporting, would effectively reduce the potential degradation of surface water quality to a less-than significant level. Adherence to these requirements would also effectively reduce potential impacts associated with spills or leaks of hazardous materials and stormwater quality during construction. Thus, construction of this element would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The impact would be less than significant.

Unit 3 Fish Pools, Granton Park Floodwall and Unit 2 Floodwall, and Stormwater Pump Station

The proposed work within the lower reach of Unit 3 and upper Unit 2 includes the construction or enhancement of up to 12 fish pools within the channel, constructing new 2- to 4-foot-tall floodwalls along the left bank that would either be attached to the existing floodwall or setback from the floodwall at the edge of District property, depending on USACE Section 408 authorization. The USACE may also require removal of trees within 15 feet of the existing floodwall and up to the limits of District property as part of the Section 408 authorization. The USACE has the authority to require removal of trees within 15 feet of the existing floodwall in the absence of the project. The project also includes a stormwater pump station at Laurel Avenue, adjacent to the channel's left bank. Construction of the floodwalls and pump station would temporarily expose loose soil; however, when completed, these structures would cover much of the exposed soil. Remaining disturbed areas would be revegetated to the extent allowed by the USACE. Construction or enhancement of fish pools would involve dewatering and bypass pumping to facilitate construction. Pools would be formed by removing existing concrete, excavating the pool, and installing new concrete to line the pool. Excavated concrete and sediment would be removed from the channel. Although the channel and banks are concrete through this reach, the use of construction equipment has the potential to cause accidental release of hazardous materials in and around the channel and may contaminate soils under the existing concrete channel exposed during pool, floodwall, and stormwater pump station construction.

As mentioned in the elements above, compliance with the Construction General Permit and implementations of the SWPPP and associated BMPs would reduce the potential degradation of surface water quality and potential impacts from construction-related spills or leaks. Therefore, construction of this element would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The impact would be less than significant.

Unit 2 Lower College of Marin Concrete Channel Removal

The lower College of Marin concrete channel removal will involve the removal of the concrete-lined flood control channel downstream of Stadium Way to restore natural creek function and create tidal and wetland habitat. The removal of trees and concrete in this unit will expose sediment and dirt to runoff, stream flows, and tidal action. The use of equipment in the channel and accidental release of hazardous materials has the potential to contaminate soil and sediments that would later spread following precipitation, runoff, or stream and tidal flows.

Much of the exposed area will be revegetated with native vegetation; however, re-exposed channel sediments could be mobilized during tidal flows. The Unit 2 concrete channel removal project area is within the tidal influence of the San Francisco Bay. The Central San Francisco Bay is listed on the 303(d) list for mercury, PCBs, furan compounds, dioxin compounds, pesticides, and other contaminants. Sediments that would be excavated and exposed during construction could potentially be contaminated due to existing known contaminants in the San Francisco Bay, and the construction could result in transport of sediments and associated pollutants into San Francisco Bay. The transport of contaminated sediment to San Francisco Bay would be a significant impact. The implementation of **Mitigation Measure 3.9-1: Conduct Soil/Sediment Testing**, would ensure that soil and sediment exposed by the project is tested and any contaminated sediments are removed/immobilized.

As mentioned in the analysis of the other project elements construction above, compliance with the Construction General Permit and implementations of the SWPPP and associated BMPs would reduce the potential degradation of surface water quality and potential impacts from construction-related spills or leaks. Therefore, with the implementation of the SWPPP, associated BMPs, and Mitigation Measure 3.9-1, construction of the lower College of Marin concrete channel removal would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The impact would be less than significant with the application of the prescribed mitigation measure.

Operation and Maintenance

Maintenance of the proposed project will include routine vegetation management, sediment and debris removal, and annual inspection and maintenance of the floodwalls and structures. Vegetation management would likely occur annually or on an as-needed basis and would not include ground-disturbing activities and would employ hand tools, thus minimizing risks of water quality impacts from spills or equipment leaks in the channel or erosion from disturbed soils. Debris and sediment would be removed from Corte Madera Creek as needed, and the frequency of debris and sediment removal and inspections would be similar to the existing maintenance of the concrete channel. The District's routine maintenance activities on Corte Madera Creek are addressed in the Marin County Flood Control Stream Maintenance Program, which was previously evaluated under CEQA and approved by the District in 2012. Maintenance of the proposed project would be consistent with the activities and impacts addressed in the previously authorized Marin County Flood Control Stream Maintenance Program. The impact discussion below focuses on operational impacts of the project.

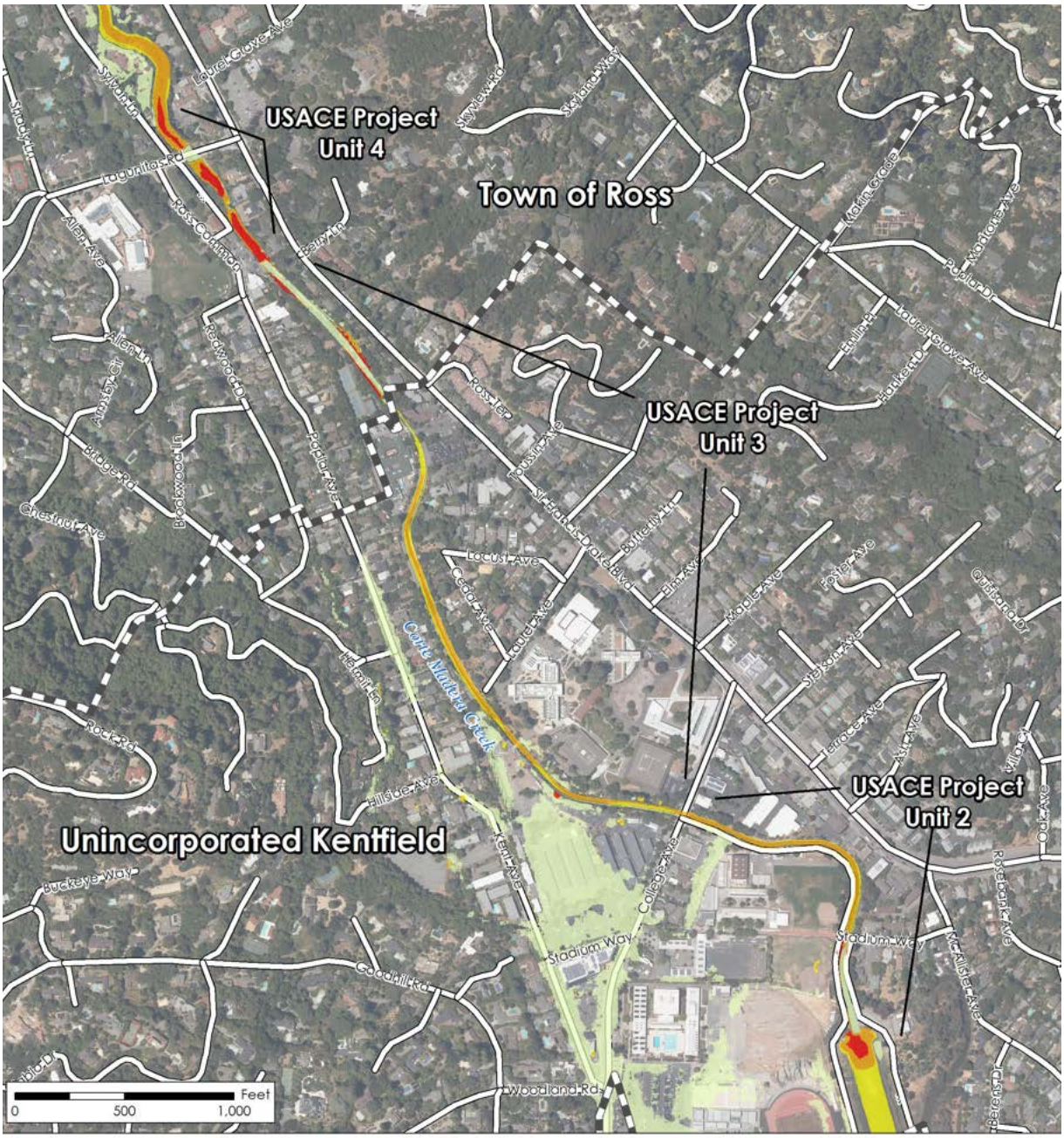
Unit 4

The project change in flow velocity under existing conditions is shown in Attachment E. As shown in Figure 3.9-4 through Figure 3.9-6, the project would increase flow velocities in the channel through most of Unit 4, while decreasing velocities around Lagunitas Road Bridge. Since velocity increases of 2 to 4 feet/second (increase of 20 to 50 percent) would occur throughout much of this unit compared to the no project conditions, the project designs include multiple elements to reduce erosion potential. The area of the removed Denil fish ladder at the transition between Unit 4 and Unit 3 will be stabilized with a concrete apron to prevent erosion and protect the buried Ross Valley Sanitary District pipeline. Segment of the new channel upstream of the removed fish ladder would be widened and provide a smooth grade transition that would support long term channel stability and reduce erosion potential. Site-specific creek-bank toe protection and bank stabilization will be installed in areas determined to be at increased risk of erosion or scour. Creek-toe protection may include a new buried rock keyway, bioengineered stabilization using willows and other native planting, and reinforced concrete wall. Additional as-needed channel stabilization and reinforcement would include installation of erosion-control fabric and engineered streambed material. The improvements would provide long-term streambank stabilization and erosion control in Unit 4. The project would not contribute to violation of water quality standards or result in increased discharge of pollutants during the operational period because long-term sediment control is incorporated into the project design. The impact would be less than significant.

Unit 3 Frederick Allen Park

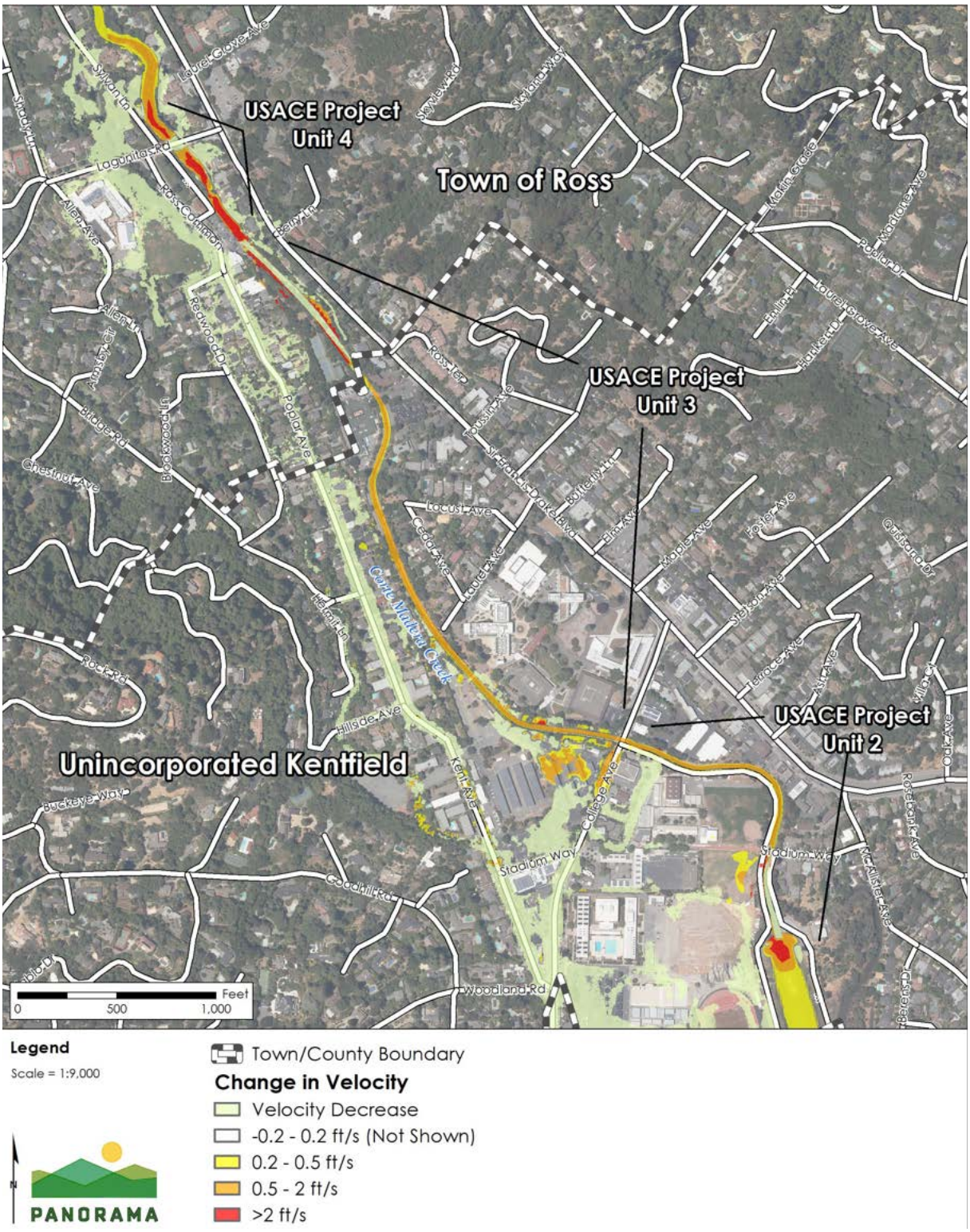
The project design in Frederick Allen Park includes retaining walls and a paved multi-use path to provide permanent soil stabilization within the area. Vegetation would be planted in proximity to the creek and would provide shade for the creek. The increased riparian vegetation and shading of the creek would have a beneficial impact on water quality because the vegetation would provide nutrient retention benefits and the temperature in the natural shaded channel would be less than the existing concrete-lined channel. A split-rail fence would be installed near the multi-use path to prevent encroachment into the habitat areas during the vegetation establishment period. A new access to the creek would be provided from the low point in the multi-use path. The new creek access would allow for pedestrian access only and signs would be placed to educate the public about the habitat and creek and discourage littering and off trail access into habitat areas. The public educational signage and placement of trash receptacles would reduce the risk of water quality impacts from erosion and trash to a less--than-significant level. The removal of the concrete channel, grading of the floodplain and streambanks, and removal of trees in the Frederick Allen Park area will expose soils to overland flows and flood flows, increasing the risk of erosion in the newly disturbed areas. The potential for erosion due to changes in flood elevations and velocities is discussed in further detail in Impact 3.9-2 below, however widening the channel cross-sectional form and constructing instream benches at Frederick Allen Park is anticipated to decrease relative water velocities on

Figure 3.9-4 Project Changes in Velocity from Future Conditions, 10-Year Flood Event



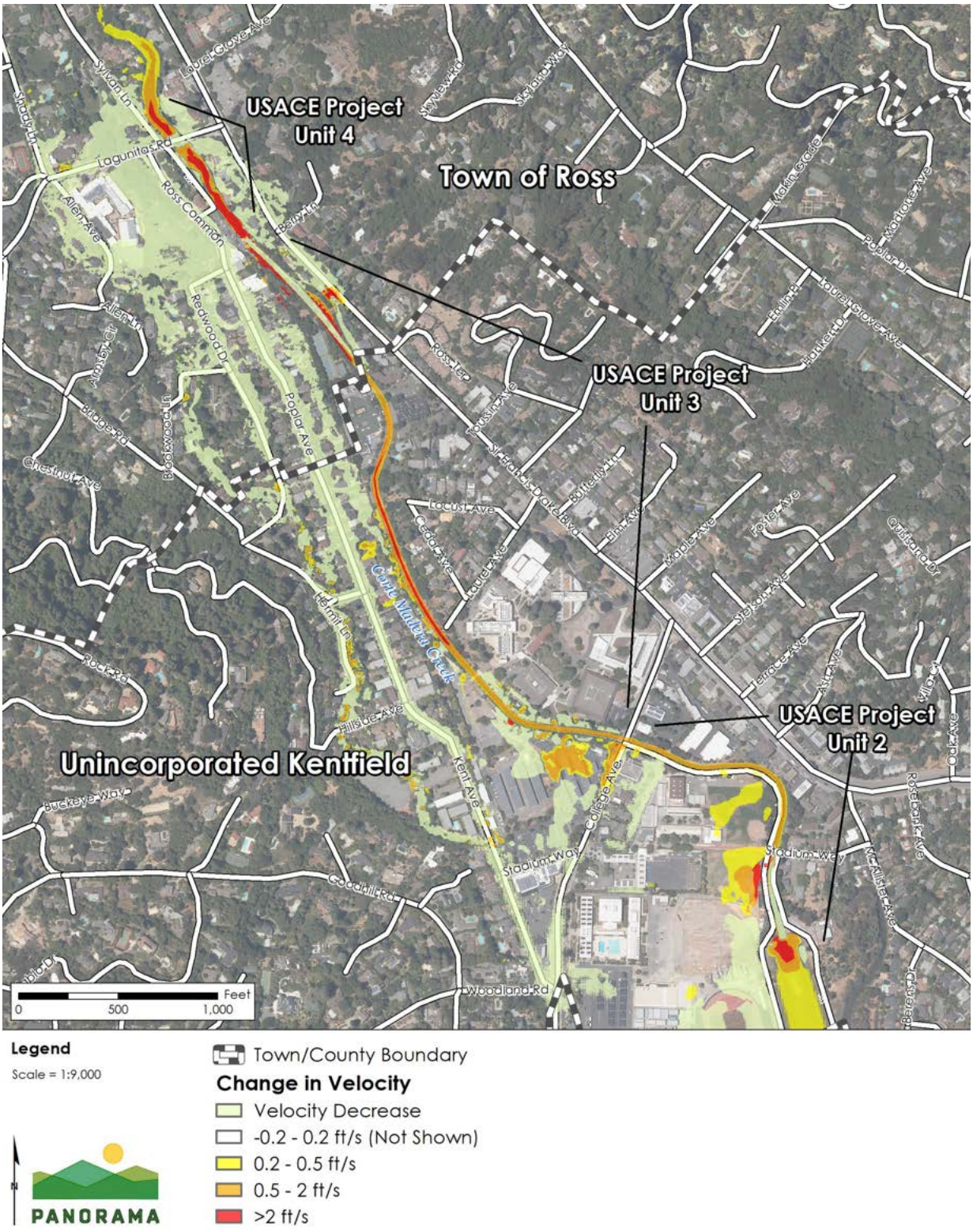
Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure 3.9-5 Project Changes in Velocity from Future Conditions, 25-Year Flood Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure 3.9-6 Project Changes in Velocity from Future Conditions, 100-Year Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

vegetated or unarmored slopes, thereby decreasing the risk of erosion to a less-than-significant level. However, soil and sediment erosion could potentially increase turbidity or transportation of pollutants if eroded soils are contaminated. The potential increase in turbidity or transportation of pollutants from soils that could be contaminated is considered a significant impact to downstream water quality. Implementation of Mitigation Measure 3.9-1 would ensure that soil and sediment exposed by the project is tested and any contaminated sediments are removed/immobilized during construction. Therefore, with the implementation of Mitigation Measures 3.9-1 the Frederick Allen Park modifications would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The impact would be less than significant with mitigation.

Unit 3 Fish Pools, Granton Park Floodwall and Stormwater Pump Station, and Unit 2 College of Marin Floodwall

The Unit 3 fish pools would be lined with concrete to provide the structural integrity needed for the fish pools and the concrete channel and seal the pool from groundwater. The concrete-lined fish pools would not create an increased risk of sedimentation and would have no long-term impact on water quality. The floodwalls in Units 3 and 2 will be concrete and would not be at risk of erosion. The floodwalls in Units 3 and 2 may require permanent tree removal to comply with USACE Section 408 requirements. USACE has the authority to require removal of trees within 15 feet of the existing floodwall. If USACE requires tree removal, the roots and stump of the tree would remain in place and the tree removal would not create a significant source of erosion or other impacts on water quality. The pump station would be stabilized with concrete and gravel and would not cause a significant water quality impact. The impact on water quality would be less than significant.

Unit 2 Lower Corte Madera Creek (Phase 2)

The Unit 2 lower College of Marin concrete channel removal and restoration is being designed to be a natural, self-maintaining creek ecosystem, resilient to sea-level rise and climate change. Minimal routine maintenance is anticipated. In the event unforeseen maintenance is required, such as to address storm flow debris, washed up boats, or other man-made debris in the area that affects the natural function of the habitat, the District would conduct maintenance activities consistent with the existing District maintenance program.

Following concrete removal, much of the exposed area will be revegetated with native vegetation. However re-exposed channel sediments along the lower banks and streambed could be mobilized during tidal flows or flood events, potentially increasing turbidity and transporting associated pollutants into San Francisco Bay. Implementation of Mitigation Measure 3.9-1 would ensure that soil and sediment exposed by the project is tested and any contaminated sediments are removed/immobilized during construction. In addition, site-specific bank protection will be installed in areas determined to be at increased risk of erosion or scour and creation and enhancement of vegetated tidal habitat would minimize the risk of erosion and increased turbidity to a less than significant level. Therefore, with the implementation of Mitigation Measures 3.9-1, operation and maintenance in this element would not violate any water quality standards or waste discharge requirements or otherwise

substantially degrade surface or ground water quality. The impact would be less than significant with mitigation.

Mitigation: Implement Mitigation Measure 3.9-1.

Mitigation Measure 3.9-1: Conduct Soil/Sediment Testing. Excavated and exposed soil and sediment at risk of erosion or mobilization will be tested for contaminants of potential concern (COPCs) for concentrations above SFBRWQCB's Environmental Screening Levels (ESLs) for shallow soils, where groundwater is not a drinking water source, for commercial land use. Additional sampling results shall be compared to the Total Threshold Limit Concentrations (TTLCs) specified in California Code of Regulations (CCR) Title 22 Chapter 11 for hazardous waste identification. Soils will be tested prior to initiation of excavation activities to determine appropriate treatment, storage, and suitability for on-site onsite reuse, landfill disposal, or hazardous waste disposal.

Significance after Mitigation: Mitigation Measures 3.9-1 would reduce the potential impact on water quality to less than significant by requiring testing of soils and sediment at risk of erosion or mobilization and removal or immobilization of any soils found to be over applicable water quality standards.

Impact 3.9-2: The project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: **i. result in substantial erosion or siltation on- or off-site;** **ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;** **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.**	**Significance Determination** **Construction: Less than Significant** **Operation and Maintenance: Less than Significant**

Construction

Erosion and Siltation (i)

In-channel construction would occur during the dry season when creek flows would be lowest. During construction, remaining surface flows would be diverted around areas of active construction, minimizing potential erosion during construction activities.

Immediately following construction dry-season flows would come in contact with the recently graded bed and constructed earthen streambanks in Unit 4 and Frederick Allen Park. However,

channel stabilization measures implemented during construction including planted rock, vegetated soil lifts, erosion-control fabric, and engineered streambed material in these units would decrease the risk of erosion immediately following construction to a less than significant level.

The enlarged fish pools in the concrete-lined flood control channel in Unit 3 will be lined with concrete to prevent groundwater infiltration. The fish pools and existing concrete channel would not be subject to erosion or siltation during or immediately following construction because no sediment would be exposed to erosion or siltation.

During construction, Unit 2 will be dewatered using a temporary berm and sheet wall with upstream flows diverted around the work area. Immediately following construction, recently exposed soil and sediment in a portion of the channel will be exposed to dry season flows and tidal influence. Newly exposed earthen banks will be revegetated while, the streambed and intertidal mudflats will remain unvegetated. Given the channel slope, increased cross-sectional channel width, and low elevation relative to sea level, fluvial processes in Unit 2 are anticipated to be depositional as tidal action becomes the primary geomorphic process, similar to existing conditions. The impact would be less than significant.

Runoff and Flood Flows (ii), (iii), (iv)
In-channel construction would occur during the dry season when creek flows would be lowest. Therefore, construction of the project would not result in substantial changes in runoff. Temporary dewatering and diversion activities would be finished prior to wet season flows and would not impede or redirect flood flows. Therefore, construction of the project would not substantially alter the existing drainage pattern of the area in a manner that would result in substantial water quality or hydrological impacts. The impact would be less than significant.

Operation and Maintenance
Erosion or Siltation (i)
The project would alter flow velocities along much of the channel during high flow events as shown in Figure 3.9-4 through Figure 3.9-6. Increased flow velocities could potentially increase erosion in creek sections lacking streambank or bed protection or where existing channel protection is removed. As such, project designs include toe protection and scour protection in areas identified as potentially at risk of erosion.

As mentioned in Impact 3.9-1, the project would increase flow velocities in the channel through most of Unit 4, while decreasing velocities around Lagunitas Road Bridge. Since velocity increases of 2 to 4 feet/second (increase of 20 to 50 percent) throughout much of this unit, project designs include multiple elements to increase bank and bed stability and reduce erosion potential due to increases in streamflow velocity.

In the Frederick Allen Park portion of Unit 3, velocity decreases of 3 to 8 feet/second (increase of 20 to 50 percent) would occur due to the much wider channel cross section and increased roughness. Given the change from concrete to earthen channel here, this decrease in flow

velocity is anticipated to be proportionate to the reduced channel sheer strength and neutral in respect to sediment transport conditions within the Frederick Allen Park portion of Unit 3.

In the downstream portion of Unit 3, flow velocities would generally increase slightly by 0 to 2 feet/second (increase of 0 to 20 percent). Since this portion of Unit 3 is a concrete channel, these increases would not increase the potential for erosion, and sediment deposition rates would be unaffected or decrease as compared to existing conditions in this portion of the creek. Similarly, the upstream portion of Unit 2, which is also a concrete channel, would experience slight increases in velocity (0.5 to 0.75 feet/second, equivalent increase of 5 to 10 percent) with little change in erosion or siltation potential.

In Unit 2 downstream of Stadium Way, streamflow velocity would decrease resulting from the expanded cross-sectional area of the channel, while improved flood containment would increase streamflow volume, by keeping flows that previously would have gone overbank now in the channel, resulting in greater instream flows. This increase in streamflow volume translates in the hydraulic model as an increase in flow velocity at the transition from the existing concrete channel to an earthen channel, as shown on Figure 3.9-4 through Figure 3.9-6. However, since tidal processes are the primary hydrological driver in this reach, actual flow dynamics in the lower portion of Unit 2 are anticipated to be comparable to existing conditions. In addition, the proposed project design gradually expands the channel cross-sectional from 32 feet to 180 feet (approximate) over a distance of 625 linear feet (approximate) as compared to existing conditions where the channel expands from 32 feet to 180 feet over 85 linear feet (approximate). This elongated, more gradual increase in channel width would lower the potential for eddying and subsequent bank erosion at the point of expansion. Considering the tidal flow regime, low gradient channel slope, and increased channel cross-sectional area, the erosion or siltation potential in the lower portion of Unit 2 is anticipated to be comparable to existing conditions during project operation. The impact on erosion and siltation would be beneficial and less than significant.

Surface Runoff and Stormwater Drainage (ii) and (iii)

The project involves removal of concrete in Frederick Allen Park and at lower College of Marin in Unit 2. The removal of impervious surfaces and replacement with riparian and marsh habitat would reduce surface runoff and have a beneficial effect by reducing runoff. The project includes installation of a stormwater pump station that would have a beneficial effect on the stormwater drainage system. The project would not generate substantial additional sources of polluted run-off as discussed in Impact 3.9-1 above. The impact would be beneficial and less than significant.

Impede or Redirect Flood Flows (iv)

The project involves modification to the USACE constructed concrete-lined flood control channel and installation of a stormwater pump station and floodwalls to redirect flood flows into Corte Madera Creek and reduce flooding in residential areas. The changes in WSE in the areas surrounding the project are shown in Figure 3.9-7 through Figure 3.9-9. In general, the project will decrease flooding in portions of Ross and Kentfield, while leading to slight increases

in flood elevations in small areas around the College of Marin, specifically the College of Marin parking lot. Flood inundation would not occur in any areas not already inundated during the 100-year event.

The Frederick Allen Park project component would also increase the conveyance capacity of the channel by removing the current channel constriction at the Denil fish ladder. Thus, while the project would redirect flood flows from residential areas to Corte Madera Creek, the impact from redirection of flood flows from residential areas to the creek channel would be beneficial and the impact would be less than significant.

Mitigation: None required.

Impact 3.9-3: The project would not risk release of pollutants as a result of project inundation due to tsunami	**Significance Determination**
	Construction: Less than Significant
	Operation and Maintenance: Less than Significant

Construction

The Unit 2 concrete channel removal area is in a designated tsunami inundation area, as shown on Figure 3.9-3. Construction activities would occur within the tsunami inundation area during concrete removal, channel grading, and habitat enhancement activities. In-channel construction would occur over a six-week period from September 1 to October 15. However, it is extremely unlikely that a tsunami would affect the project area during the six-week construction period for several reasons. Tsunamis rarely affect California with only 76 recorded events over a 200-year period (1812-2012) with a wave height exceeding 1 meter (CDOC 2021). Tsunamis cannot originate from San Francisco Bay as regional faults are transform (horizontal) faults that do not cause the displacement necessary to result in a tsunami. The effects of tsunamis originating in the Pacific Ocean are significantly dampened by regional topography, specifically the 1-mile-wide constriction at the Golden Gate, the Tiburon Peninsula, and Angel Island. In addition, the project does not increase the potential to cause a tsunami nor increase the wave amplitude if one occurred. Therefore, the risk release of pollutants as a result of project inundation due to tsunami would be less than significant.

Operation and Maintenance

Unit 2 is subject to daily tidal inundated by the San Francisco Bay. The project has been designed to address inundation from tides, sea level rise, and flooding due to large rain events. None of the project elements will introduce pollutants to the area that could be mobilized during operation as a result of inundation due to a tsunami. Potential impacts due to tsunami would be less than significant.

Mitigation: None required.

Impact 3.9-4: The project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	Significance Determination
	Construction: Less than Significant
	Operation and Maintenance: Less than Significant

Water Quality Control Plan

The San Francisco Bay Plan lists multiple beneficial uses for Corte Madera Creek, the Ross Valley Groundwater Basin, and the Central San Francisco Bay (Table 3.9-4). As described above, the project would not significantly affect groundwater and would therefore not affect the groundwater basin's beneficial uses. The removal of the concrete flood control channel and creation of a channel with natural substrate and riparian vegetation in Frederick Allen Park, removal of the Denil fish ladder, construction of larger fish resting pools, and creation of saltwater marsh in Unit 2 would have a beneficial effect for uses relating to noncontact recreation, fish migration and habitat, and preservation of rare and endangered species. The project would not significantly affect uses related to water contact recreation, navigation, industrial service or process supply, or shellfish harvesting as compared to existing conditions. Table 3.9-6 below, contains additional detail on project impacts on beneficial uses. The impact would be less than significant.

Sustainable Groundwater Management Plan

The SGMA Basin Prioritization process designated the Ross Valley Groundwater Basin as a very low priority, therefore the project is not in an area subject to a sustainable groundwater management plan (DWR, 2019). The project would have no impact on implementation of a sustainable groundwater management plan.

Mitigation: None required.

Table 3.9-6 Project Impacts on Beneficial Uses

Beneficial Use	Waterbody	Project Impacts
Agricultural Supply	Ross Valley Groundwater Basin	**No impact.**
Municipal and Domestic Supply	Ross Valley Groundwater Basin	**No impact.**
Industrial Service Supply	SF Bay – Central, Ross Valley Groundwater Basin (Potential)	**No impact.**
Industrial Process Supply	SF Bay – Central, Ross Valley Groundwater Basin (Potential)	**No impact.**
Commercial and Sport Fishing	Corte Madera Creek, SF Bay – Central	**Beneficial.** The project improves instream migration and habitat for steelhead.
Shellfish Harvesting	SF Bay – Central	**No impact.**

Beneficial Use	Waterbody	Project Impacts
Cold Freshwater Habitat	Corte Madera Creek	**Beneficial.** The project improves upstream and downstream migration and creates new rearing habitat suitable for salmonids.
Estuarine Habitat	SF Bay – Central	**Beneficial.** The Project creates 0.6 acre of new salt marsh habitat.
Fish Migration	Corte Madera Creek, SF Bay – Central	**Beneficial.** Removing the defunct fish ladder, reducing the channel slope, adding and enhancing fish pools, and removing the concrete in portions of Unit 2 and 3 improve upstream and downstream migration and rearing habitat for salmonids.
Preservation of Rare and Endangered Species	Corte Madera Creek, SF Bay – Central	**Beneficial.** The project improves instream habitat and migration for listed salmonids. Creation of salt marsh habitat in Unit 2 increases suitable habitat for California Ridgway's rail and salt marsh harvest mouse.
Fish Spawning	Corte Madera Creek, SF Bay – Central	**No impact.** The project area lacks spawning habitat.
Warm Freshwater Habitat	Corte Madera Creek	**Beneficial.** The project improves bank stability and decreases erosion potential in Unit 4 and creates higher value riparian habitat within Frederick Allen Park.
Wildlife Habitat	Corte Madera Creek, SF Bay – Central	**Beneficial.** The project creates 0.6 acre of new tidal and wetland habitats and 0.8 acre of new riparian and upland transitional habitats in Unit 2 and creates higher value riparian habitat within Frederick Allen Park.
Water Contact Recreation	Corte Madera Creek, SF Bay – Central	**No impact.**
Noncontact Water Recreation	Corte Madera Creek, SF Bay – Central	**Beneficial.** Noncontact forms of water recreation (walking, sightseeing, wildlife watching and aesthetic enjoyment) are improved by replacing concrete portions of the channel and increasing riparian and wetland habitats within Fredrick Allen Park and in portions of Unit 2.
Navigation	Corte Madera Creek, SF Bay – Central	**No impact.**

Sources: (SFBRWQCB, 2017)

Impact 3.9-5: The project would not expose people or property to flooding hazards	Significance Determination
	Construction: Less than Significant
	Operation and Maintenance: Less than Significant

Construction

In-channel construction would occur during the dry season when anticipated creek flows would be lowest. In addition, a diversion and dewatering system would be implemented to facilitate construction within the channel. Therefore, construction of the project would not result in the exposure of people or property to water related hazards. The impact would be less than significant.

Operation and Maintenance

Overview

The project will reduce flooding within the Town of Ross and in unincorporated Kentfield. The effectiveness of the project in reducing flood hazards was evaluated through hydraulic modeling under the 10-year (10 percent probability in any given year), 25-year (4 percent probability in any given year), and 100-year (1 percent probability in any given year) flood recurrence intervals. The existing floodway and 100-year flood zone are shown in Figure 3.9-3.

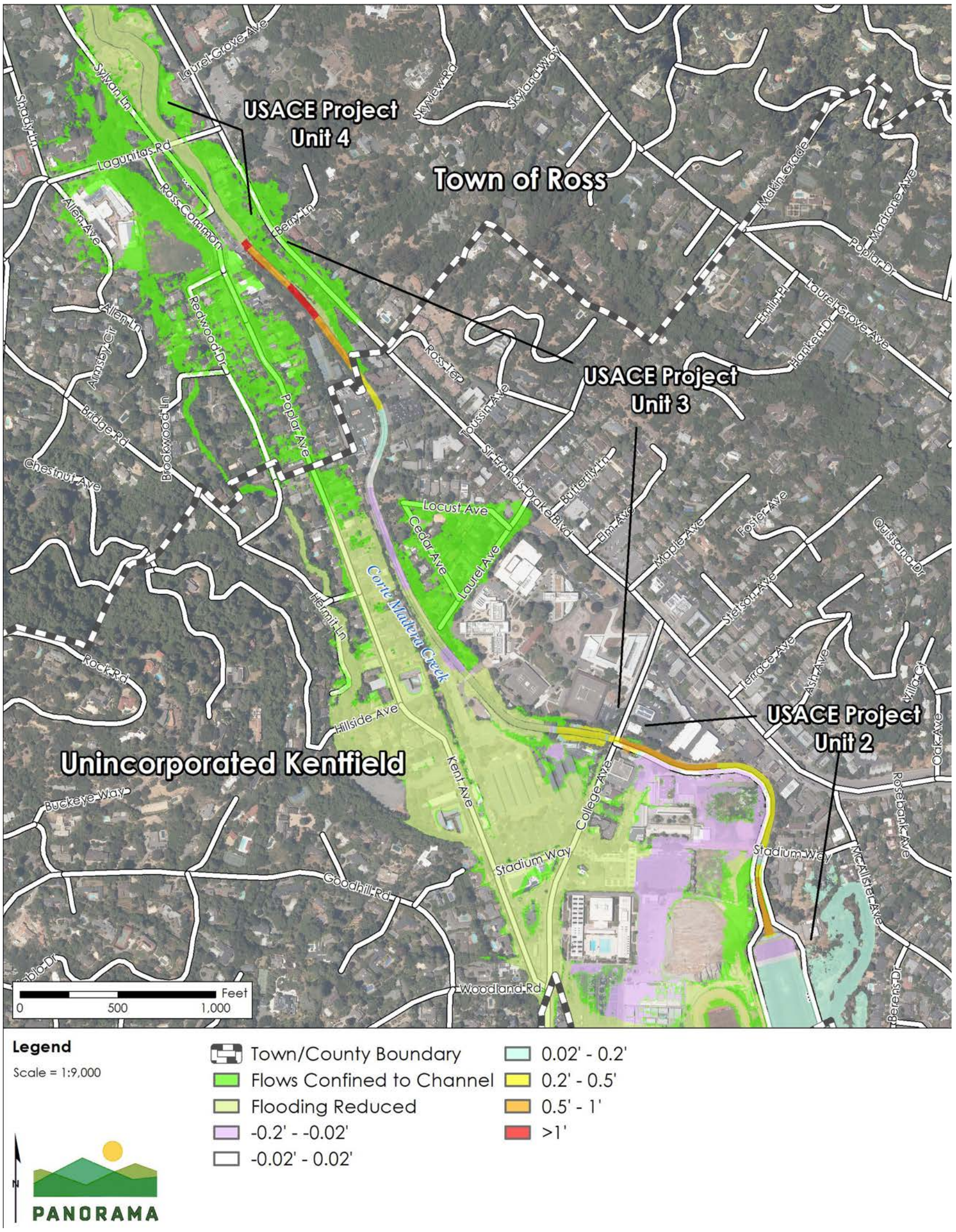
The project impacts are shown graphically as the change in WSE or flood depth that would result from the project during the 10-, 25-, and 100-year flood events. The project impacts on existing flood conditions are presented in Appendix E. The project impacts on future conditions are presented in Figure 3.9-7 through Figure 3.9-9. The model-predicted flood inundation depths are shown for the 10-year, 25-year, and 100-year events for the existing condition without project, existing condition with project, future condition without project, and future condition with project scenarios in Appendix E. Areas shown in the figures as "Flows Confined to Channel" are areas that are predicted to no longer have flood inundation from creek overtopping after the project is completed. Areas shown in the figures with "Flooding Reduced" are areas with significantly reduced flood inundation (greater than 0.2 foot) from creek overtopping after the project is completed. The impacts are described below by condition and area.

Project Impact on Existing Condition and Future Condition

Town of Ross (Unit 4 and Frederick Allen Park)

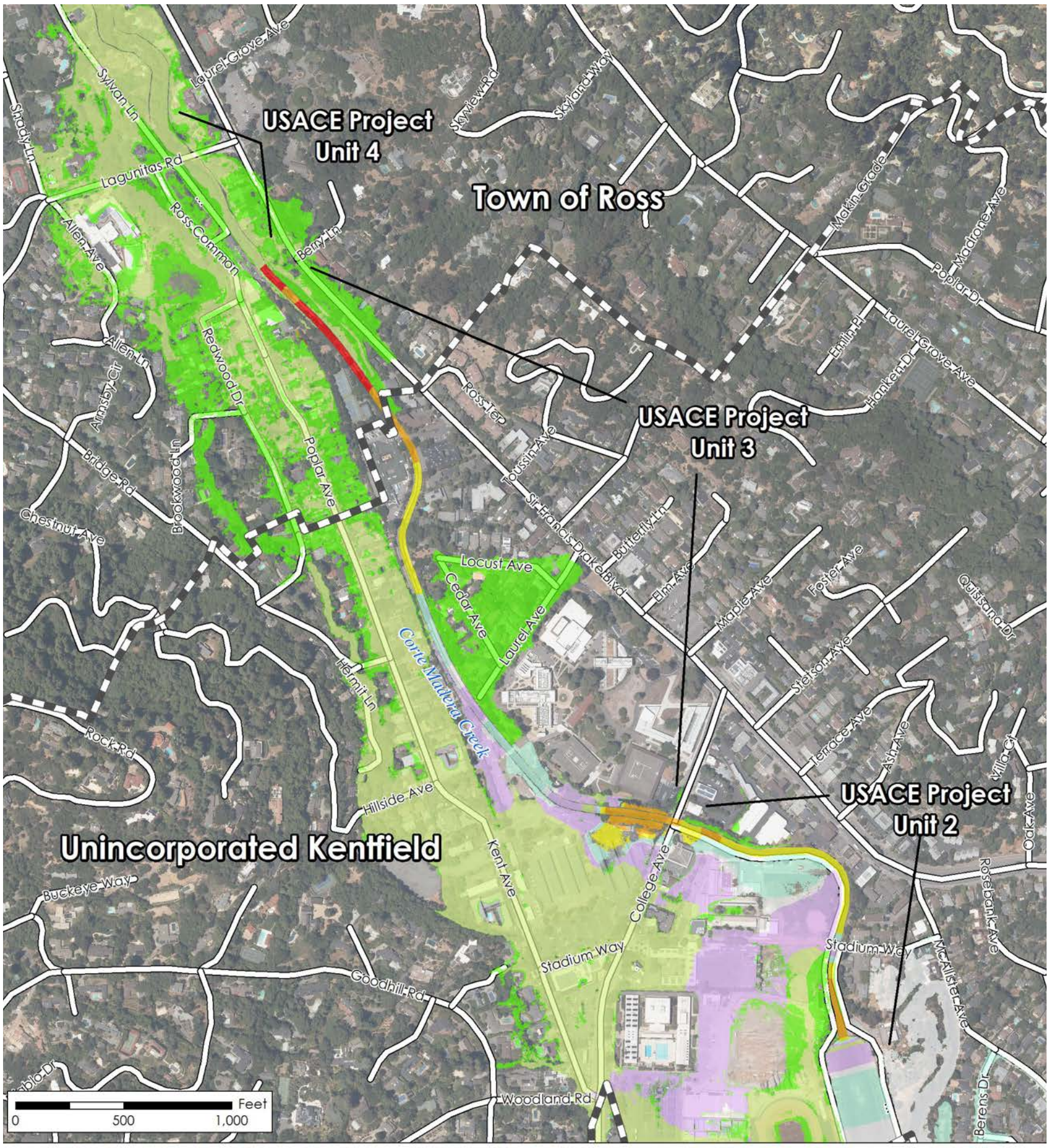
In Ross, flooding due to creek overtopping would be reduced throughout most of the existing flood inundation areas under the 10--year, 25-year, and 100-year flood scenarios for both existing and future conditions. Substantial reduction in flood elevation would occur along portions of Sylvan Lane, Lagunitas Road, Allen Avenue, Ross Common, Poplar Avenue, and Redwood Drive. The greatest improvements in flooding would be seen under the 10-year and 25-year flood scenarios under both existing and future conditions. In Frederick Allen Park, the graded/lowered areas would see increased flood inundation as those areas would be a part of the widened natural creek corridor for flow conveyance. Section 3.8 Hazards addresses the potential flood hazard within Frederick Allen Park.

Figure 3.9-7 Project Changes in Water Surface Elevation from Future Conditions, 10-Year Flood Event



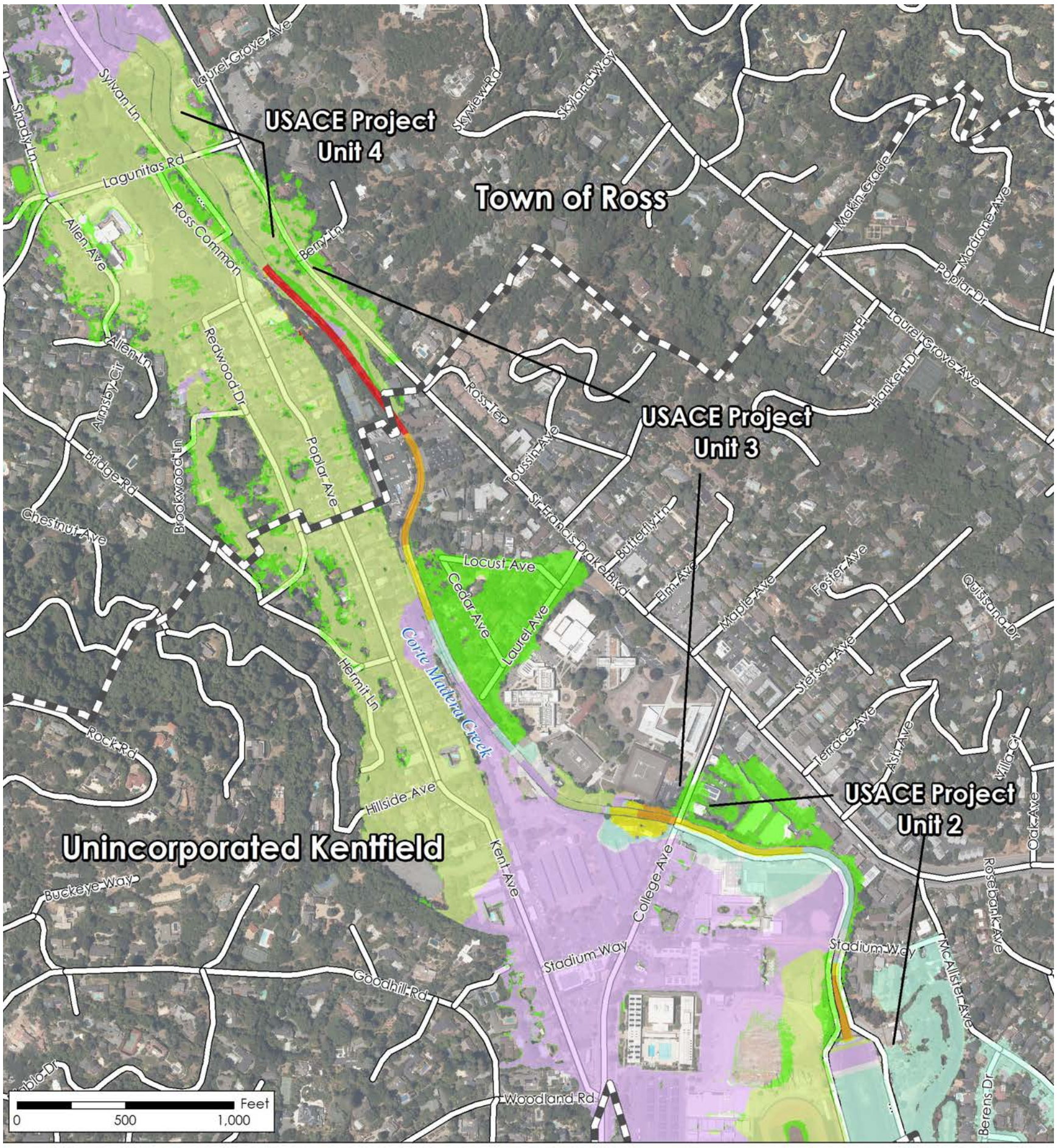
Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure 3.9-8 Project Changes in Water Surface Elevation from Future Conditions, 25-Year Flood Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

Figure 3.9-9 Project Changes in Water Surface Elevation from Future Conditions, 100-Year Flood Event



Legend

Scale = 1:9,000

- Town/County Boundary
- Flows Confined to Channel
- Flooding Reduced
- -0.2' - -0.02'
- -0.02' - 0.02'
- 0.02' - 0.2'
- 0.2' - 0.5'
- 0.5' - 1'
- >1'

PANORAMA

Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

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Increased flood inundation due to creek overtopping would not occur in the vicinity of Unit 4 in any commercial or residential areas. Operation and maintenance of the project would result in a net reduction of flooded residential and commercial areas and reduced water depth during flooding, thereby reducing the exposure of people and property to water-related hazards. The impact would be beneficial and less than significant.

Unit 3 (Unincorporated Kentfield)

In unincorporated Kentfield, flooding due to creek overtopping would be reduced throughout much of the existing flood inundation areas under the 10-year, 25-year, and 100-year flood scenarios for both existing and future conditions. Substantial reductions in flooding would occur in the Granton Park neighborhood along Cedar Avenue, Locust Avenue, and Laurel Avenue. The new pump station and floodwall will address the creek overtopping issue, and the creek backwater issue to the area's storm drain collection system. Note that localized overland flow may still occur when stormwater runoff in the area exceeds the storm drain pipeline capacity at Cedar Avenue and Laurel Avenue. Reduced flooding would also occur in residential and commercial areas west of Corte Madera Creek. Under the 25-year and 100-year flood scenarios for both existing and future conditions there would be WSE increases of 2 to 6 inches in small areas adjacent to the channel around the College of Marin, the Union Bank parking lot, and A.E. Kent Middle School. These impacts would be limited to parking lots, playgrounds, and elevated trailers. Localized flooding in these areas appears correlated to existing channel structures and existing hydraulic constraints at the College Avenue bridge crossing, and improved flow conveyance in Unit 4 as a result of the Denil fish ladder removal. Additional inundation due to creek overtopping would not occur in any new areas that are not already inundated during the 100-year event. Therefore, operation and maintenance of the project would result in a net reduction of flood areas thereby reducing the exposure of people and property to water related hazards. The impact would be beneficial and less than significant.

Unit 2 and Lower Corte Madera Creek

In Unit 2 and Lower Corte Madera Creek, flooding would be reduced throughout much of the existing flood inundation areas under the 10-year, 25-year, and 100-year flood scenarios for both existing and future conditions. The floodwall is proposed mainly to address potential additional creek overtopping as a result of the project, and its potential flood inundation impacts to the commercial area bounded by College Avenue, Sir Francis Drake Boulevard, and the creek. Additional inundation would not occur in any new areas that are not already inundated during the 100-year event. Increases in WSE of approximately 1 inch and less than 0.2 foot (2.4 inches) are predicted in areas downstream of College Avenue. Change in WSE less than 0.2 foot is less than the model precision and is within the range of model uncertainty as discussed in Section 3.9.5. Because the change in WSE is less than the precision of the current model, the impact is less than significant.

With the proposed project elements, including the floodwall to address potential creek overtopping to the left bank at the downstream of College Avenue, operation and maintenance of the project would result in a net reduction in flooding in the vicinity of Unit 2 and any projected increase in flooding is within the model uncertainty and less than significant. The

project would therefore reduce the exposure of people and property to water-related hazards and would not significantly increase flooding hazards. The impact would be beneficial and less than significant.

Summary of Project Benefits

The hydraulic modeling for both existing and future condition with project scenarios show either a reduction of flooding or no significant increase in flooding in areas adjacent to Corte Madera Creek in the Town of Ross or Kentfield, except in isolated, non-sensitive use areas (i.e., parking lots near College Avenue). The number of parcels by area in Ross Valley that would benefit from decreased flooding during a 25-year flood event under existing conditions are summarized in Table 3.9-7 below. The parcels that would benefit from reduced flooding during the 25-year flood event are shown in Figure 3.9-10.

Table 3.9-7 Summary of Project Flood Reduction Benefits, Existing Condition Scenario, 25-Year Event

Jurisdiction/Land Use	Number of Structures with Reduced Flooding				
	Area No Longer Inundated After Project	1 to 4.5 feet reduction in water surface	0.5 to 1 foot reduction in water surface	0.2 to 0.5 foot reduction in water surface	Total
Kentfield					
Commercial	4			5	9
Institutional	18		3	11	32
Residential	37	19	47	33	136
Kentfield Total	*59*	*19*	*50*	*49*	*177*
Larkspur					
Commercial				1	1
Institutional			2	3	5
Residential				11	11
Larkspur Total			*2*	*15*	*17*
Town of Ross					
Commercial	1	2	8		11
Institutional	3	17	3		23
Residential	2	48	35	14	99
Ross Subtotal	*6*	*67*	*46*	*14*	*133*
Total All Areas	**65**	**86**	**98**	**78**	**327**

[e] The reduction in flooding reflects changes in WSE based on model predictions for the existing hydrologic conditions. Reduction in flooding of less than 0.2 foot is below the model precision and is interpreted as no change in flood elevation.

Sea Level Rise Impacts

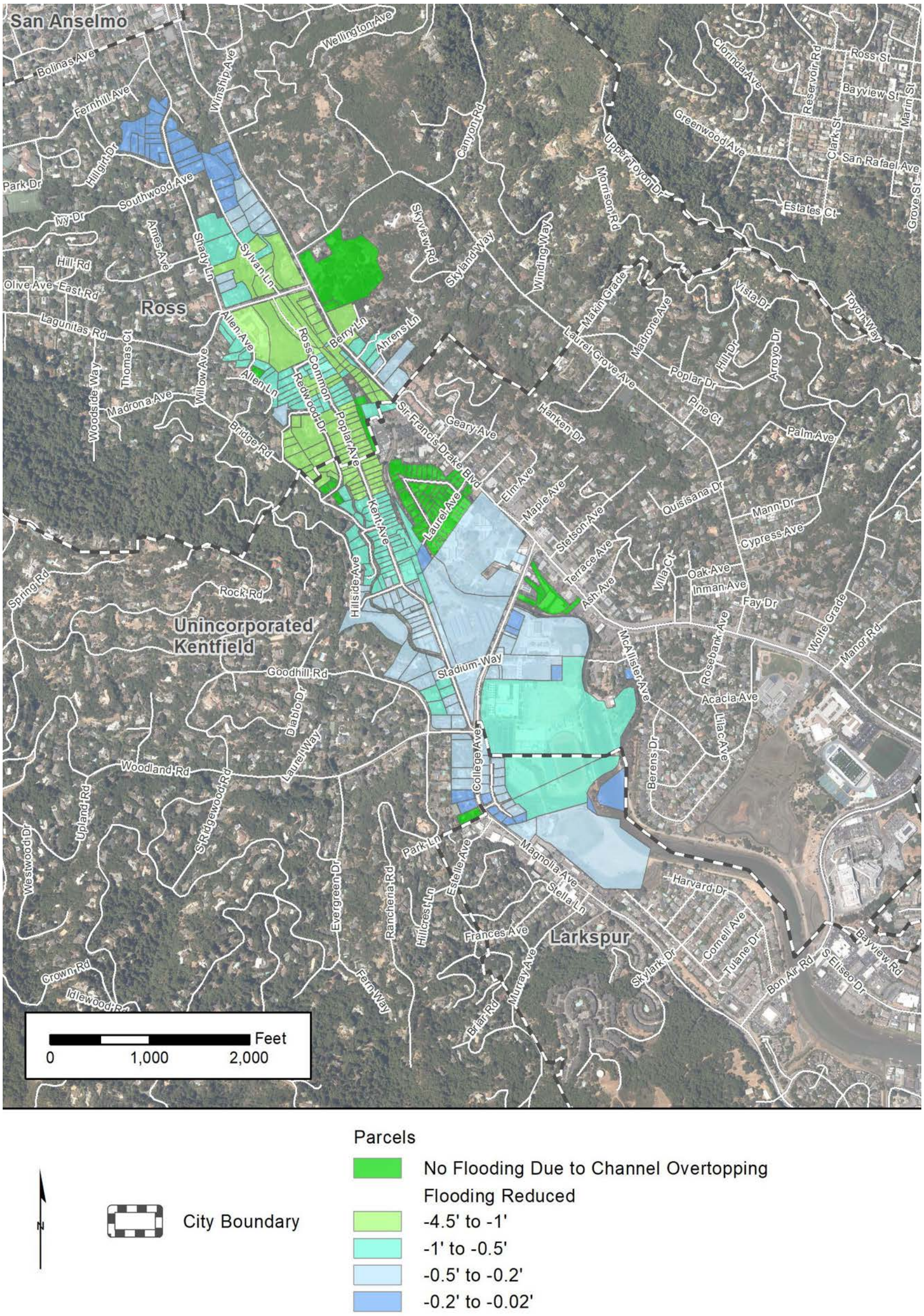
As discussed in Section 3.9.5, the future condition without project and future condition with project modeling includes an intermediate level of sea level rise of 1.0 foot. With an intermediate level of sea level rise, the project has broad benefits from reduced flooding in the Town of Ross and Kentfield areas. As presented in Table 3.9-3, there are multiple models of sea level rise and the high estimate of sea level rise exceeds the intermediate sea level rise estimate incorporated in the hydraulic modeling. Additional modeling was conducted to evaluate project impacts with current projections for sea level rise in year 2100 (CNRA 2018). The Year 2100 future condition model which includes a greater level of sea level rise shows that the project would still provide benefits by reducing flood inundation in areas within Ross Valley; however, additional areas would be subject to tidal inundation and the benefits would be less in areas that are subject to tidal inundation/flooding.

The purpose of the project is to reduce flooding on Corte Madera Creek and the project is not intended to address flooding from sea level rise. While the project does not address sea level rise impacts, the project will not exacerbate flooding impacts when sea level rise is considered and would have flood reduction benefits in areas not subject to tidal flooding, including the Town of Ross, as demonstrated by the future condition with project and Year 2100 future condition with project modeling. Separate from this project, the County has conducted a vulnerability assessment for sea level rise (Marin County Department of Public Works, 2017). Since completing the vulnerability assessment, BayWAVE has led efforts to develop a countywide collaboration for adaption, the County has evaluated a nature-based adaptation framework, and developed adaptation land use planning guidance. The County also participates in several regional efforts to plan for climate change resilience and adaptation. The Town of Corte Madera recently developed a Climate Action Plan that addresses sea level rise along the waterfront including wetlands south of Corte Madera Creek. The project supplements and will not conflict with or impact on-going planning efforts to address sea level rise effects.

Mitigation: None required.

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Figure 3.9-10 Reduction in Water Surface Elevation by Parcel, Existing Condition 25-Year Flood Event



Sources: (US Geological Survey, 2013; U.S. Geological Survey, 2016; Tele Atlas North America, Inc., 2020; Bay Area Open Space Council, 2011; GHD, 2020)

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3.10 Noise

3.10.1 Introduction

This section includes an evaluation of the potential for the project to result in adverse impacts related to noise. This section describes the existing noise environment and identifies nearby sensitive receptors, presents relevant local noise ordinances and standards, and discusses potential project impacts and appropriate mitigation measures, as necessary.

3.10.2 Scoping Comments

Comments related to noise impacts were received during the public scoping process. These comments and the location where they are addressed in the noise analysis are provided in Table 3.10-1.

Table 3.10-1 Noise Scoping Comments

Agency/Entity	Comment	Location in Noise Section that Comment is Addressed
Edi Alvarez and Neil Dukas	What noise, if any, may be associated with the ongoing operation of a pump station located at the foot of Laurel Avenue and adjacent to the creek?	Section 3.10.6, Impact 3.10-1
Garril Page	No one in Ross welcomes the noise of Sir Francis Drake Blvd. The FAP Riparian Corridor results in permanent, increased noise intrusion from SFD throughout a large portion of Ross. The longer construction period of FAP Riparian Corridor means extended, expanded exposure to all aspects of construction noise.	Section 3.10.6, Impact 3.10-1

3.10.3 Fundamentals of Noise

Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air). Noise is generally defined as unwanted sound (i.e., loud, unexpected, or annoying sound). Acoustics is defined as the physics of sound. In acoustics, the fundamental scientific model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determine the sound level and characteristics of the noise perceived by the receiver. Acoustics addresses primarily the propagation and control of sound.

Frequency

The number of sound pressure peaks travelling past a given point in a single second is referred to as the frequency, expressed in cycles per second or Hertz (Hz). A given sound may consist of energy at a single frequency (pure tone) or in many frequencies over a broad frequency range

(or band). Human hearing is generally affected by sound frequencies between 20 Hz and 20,000 Hz.

Amplitude

The amplitude of pressure waves generated by a sound source determines the perceived loudness of that source. Sound pressure amplitude is measured in micro-Pascals (μPa). One μPa is approximately one-hundred billionths of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 μPa to 100,000,000 μPa. Because of this huge range of values, sound is rarely expressed in terms of pressure. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of human hearing (near total silence) is approximately 0 dB, which corresponds to 20 μPa.

Addition of Decibels

Because dBs are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic means. Under the dB scale, a doubling of sound energy corresponds to a 3 dB increase. In other words, when two sources are each producing sound of the same magnitude, the resulting sound level at a given distance would be approximately 3 dB higher than one of the sources under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB – rather they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level of approximately 5 dB louder than one source, and ten sources of equal loudness together produce a sound level of approximately 10 dB louder than the single source.

A-Weighted Decibels

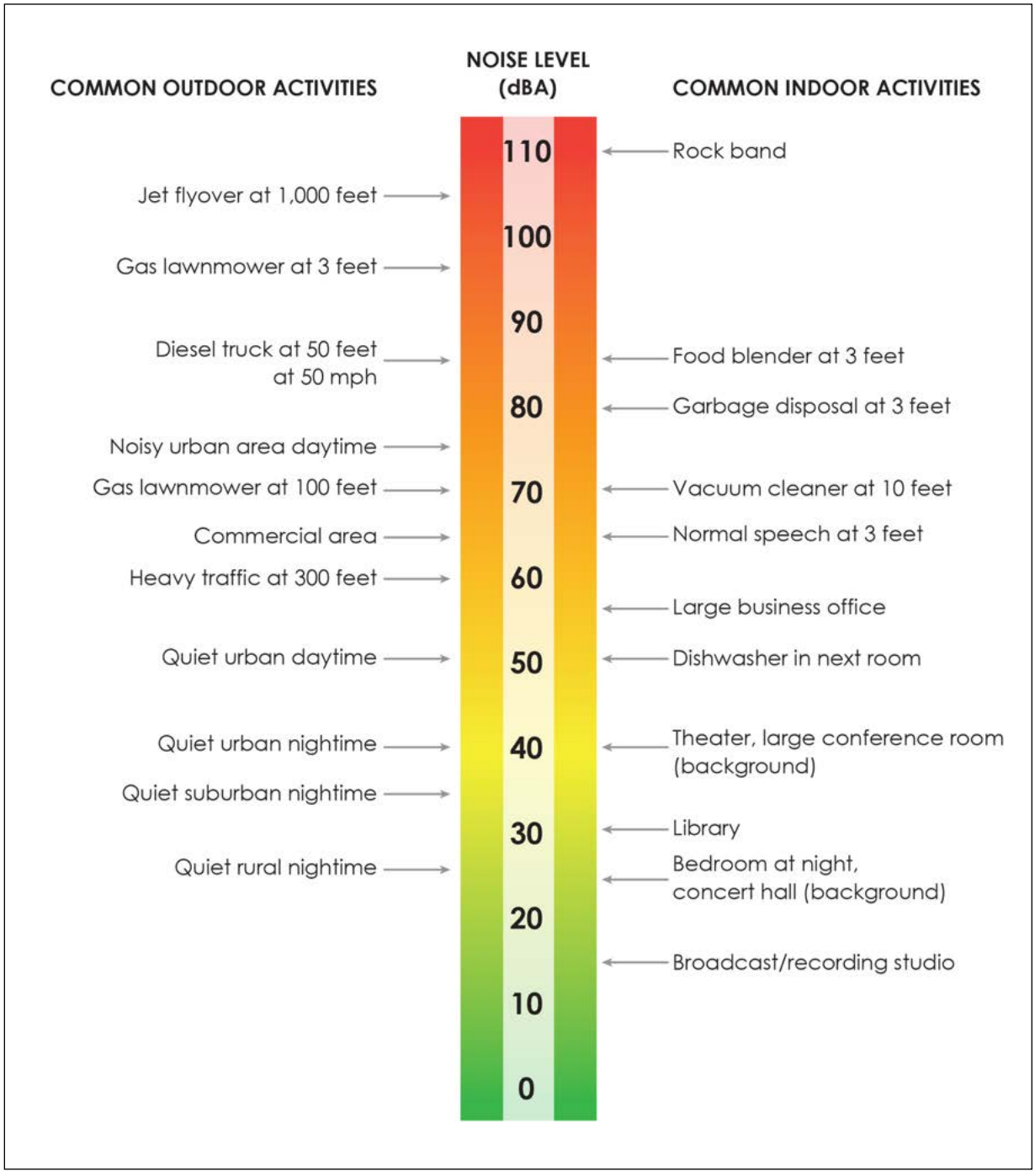
Figure 3.10-1 illustrates sound levels associated with common sound sources. The perceived loudness of sound is dependent on many factors, including magnitude and frequency. However, within the usual range of environmental sound levels, perception of loudness is relatively predictable and can be approximated by frequency filtering using the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the dBA sound level has become the standard descriptor for environmental noise assessment. All noise levels reported in this section are expressed as A-weighted levels.

Human Response to Changes in Noise Levels

As discussed above, doubling sound energy results in a 3-dB increase in sound. However, for a given sound-level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different from what is measured.

Under controlled conditions in a laboratory setting, the trained, healthy human ear is able to discern 1-dBA changes in sound levels when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency range (1,000 Hz to 8,000 Hz). In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments.

Figure 3.10-1 Typical Noise Levels



Source: (Caltrans, 2013a)

Further, a 6-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy that would result in a 3-dB increase in SPL would generally be perceived as barely detectable. Refer to Table 3.10-2 for the approximate relationship between increases in environmental noise level and human perception.

Table 3.10-2 Approximate Relationship Between Increases in Environmental Noise Level and Human Perception

Noise Level Increase, dBA	Human Perception (Typical)
Up to about 3	Generally not perceptible
About 3	Barely perceptible
About 6	Distinctly noticeable
About 10	Twice as loud
About 20	Four times as loud

Source: (Cavanaugh, Tocci, & Wilkes, 2009)

Noise Descriptors

Noise in our daily environment fluctuates over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random. Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in environmental noise analysis and are applicable to this study:

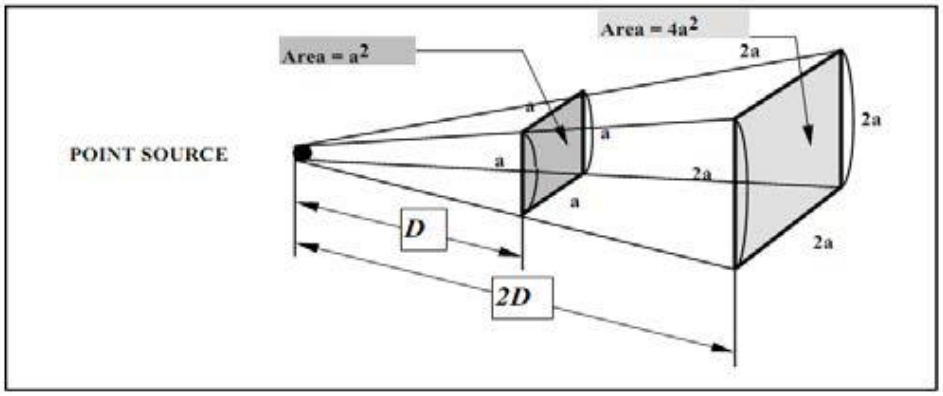
1. **Equivalent Sound Level (L_{eq}):** The L_{eq} represents an average of the sound energy occurring over a specified time period. In effect, the L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The one-hour A-weighted L_{eq} level is the energy average of dBAs occurring during a one-hour period.
2. **Maximum Sound Level (L_{max}):** The L_{max} is the highest instantaneous sound level measured during a specified period.
3. **Minimum Sound Level (L_{min}):** The L_{min} is the lowest instantaneous sound level measured during a specified period.
4. **Day–Night Average Level (L_{dn}):** The L_{dn} is the energy average of dBAs occurring over a 24-hour period, with a 10-dB "penalty" applied to dBAs occurring during nighttime hours (10:00 p.m. to 7:00 a.m.).
5. **Community Noise Equivalent Level (CNEL)**: Similar to the Ldn, the CNEL is the energy average of A-weighted sound levels over a 24-hour period, with a 5-dB penalty added for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10-dB penalty between the hours of 10:00 p.m. and 7:00 a.m.

Sound Propagation

Sound from a localized source (i.e., point source) propagates uniformly outward in a spherical pattern; therefore, this type of propagation is called spherical spreading. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source as its energy is continuously spread out over a spherical surface (see Figure 3.10-2 for an illustration of spherical spreading of noise from a point source). Point sources of noise, such as stationary equipment or on-site construction equipment, attenuate (lessen) at a rate of 6.0 dB per doubling

of distance from the source. Noise attenuation from a point source increases by 1.5 dB from 6 dB to 7.5 dB for each doubling of distance due to ground absorption and reflective wave canceling. These factors are collectively referred to as *excess ground attenuation*. The basic geometric-spreading loss rate is used where the ground surface between a noise source and a receiver is reflective, such as parking lots or a smooth body of water. The excess ground attenuation rate (7.5 dB per doubling of distance) is used where the ground surface is absorptive, such as soft dirt, grass, or scattered bushes and trees.

Figure 3.10-2 Point Source Spreading with Distance



Source: (Caltrans, 2013a)

Widely distributed noises, such as a street with moving vehicles (a "line" source), would typically attenuate at a lower rate of approximately 3 dB for each doubling of distance between the source and the receiver. If the ground surface between source and receiver is absorptive rather than reflective, the nominal rate increases to 4.5 dB for each doubling of distance. Atmospheric effects, such as wind and temperature gradients, can also influence noise -attenuation rates from both line and point sources of noise. However, unlike ground attenuation, atmospheric effects are constantly changing and difficult to predict.

Trees and vegetation, buildings, and/or barriers between a source and receiver reduce the noise level that would otherwise occur at a given receptor. However, for a vegetative strip to have a noticeable effect on noise levels, it must be dense and wide. For example, a stand of trees must be at least 100 feet wide and dense enough to completely obstruct a visual path to the roadway to attenuate traffic noise by 5 dB (Caltrans, 2013a). A row of structures can shield more distant receivers depending upon the size and spacing of the intervening structures and site geometry. Similar to vegetative strips discussed above, noise barriers, which include natural topography and soundwalls, reduce noise by blocking the line of sight between the source and receiver. Generally, a noise barrier that breaks the line of sight between source and receiver will provide at least a 5-dB reduction in noise.

Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Several descriptors are typically used to quantify the amplitude of vibration including peak particle velocity (PPV) and root

mean square velocity. PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave and is typically expressed in units of inches per second (in/sec). The PPV is most frequently used to describe vibration impacts on buildings. Root mean square velocity is defined as the average of the squared amplitude of the signal, usually measured in decibels referenced to one microinch per second, and is reported as vibration decibels (VdB). The decibel notation acts to compress the range of numbers required to describe vibration (FTA, 2006). VdB vibration velocity amplitudes are used to evaluate human response to vibration. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints even though there is very little risk of actual structural damage. In high-noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows. In suburban environments, such as the project area, sources of groundborne vibration include construction activities and heavy trucks and buses. Typically, groundborne vibration generated by human-made activities attenuates rapidly with distance from the source of the vibration.

Groundborne vibration can be an annoyance. The primary effect of perceptible vibration is often a concern. However, secondary effects, such as the rattling of a china cabinet, can also occur even when vibration levels are well below perception. Any effect (primary perceptible vibration, secondary effects, or a combination of the two) can lead to annoyance. The degree to which a person is annoyed depends on the activity in which they are participating at the time of the disturbance. For example, someone sleeping or reading will be more sensitive than someone who is running on a treadmill. Reoccurring primary and secondary vibration effects often lead people to believe that the vibration is damaging their home although those vibration levels may be well below minimum thresholds for damage potential. Vibration generated by construction activity has the potential to damage structures. This damage could be structural damage, such as cracking of floor slabs, foundations, columns, beams, or wells or cosmetic architectural damage, such as cracked plaster, stucco, or tile.

Construction Vibration

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile-driving and vibratory compaction equipment typically generates the highest construction-related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans. The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels such as people in an urban environment may tolerate a higher vibration level. Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may

threaten the integrity of the building. Construction-induced vibration that can be detrimental to a building is very rare and has only been observed in instances where the structure is in a high state of disrepair and the construction activity (e.g., impact pile driving) occurs immediately adjacent to the structure.

Table 3.10-3 displays the human reactions and effects on buildings that can be caused by various continuous vibration levels. As discussed previously, annoyance is a subjective measure, and vibrations may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations at the threshold of perception can be annoying.

Table 3.10-3 Approximate Reaction of People and Damage to Buildings from Construction Vibration Levels

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly to strongly perceptible	Recommended upper limit of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Virtually no risk of damage to normal buildings
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential dwellings such as plastered walls or ceilings
0.5	Severe – vibrations considered unpleasant	Threshold at which there is a risk of damage to newer residential structures

Source: (Caltrans, 2013a)

3.10.4 Environmental Setting

Existing Ambient Noise Environment

The project is located in a low density, suburban residential area with no close exposure to heavily traveled roadways except traffic along Sir Francis Drake Boulevard, which is readily noticeable along Corte Madera Creek. Noise sources in the project vicinity include vehicle traffic on Sir Francis Drake Boulevard and Lagunitas Road (approximately 120 feet east of upper Unit 3 and crossing Unit 4, respectively), traffic along adjacent roadways, and passing walkers, runners, and bicyclists along Bike Route 20. The majority of ambient noise in the project area is associated with transportation-related sources, especially in areas where the creek approaches or is crossed by roadways. There are no known sources of substantial permanent stationary source noise in the project area. Within the project area, the majority of perceivable groundborne vibration is associated with vehicular traffic and is limited to large, loaded vehicles such as haul trucks on local roadways.

Noise measurements were collected at three locations along Corte Madera Creek and in the vicinity of the creek to characterize existing daytime noise conditions caused by various noise sources. Ambient noise levels were monitored at general locations where noise levels are considered representative of typical uses in the area. The noise monitoring locations are shown in Figure 3.10-3.

Noise levels were monitored using an Extech SDL600, Type 2 meter, which meets the standards of the American National Standards Institute (ANSI) for general environmental noise measurement instrumentation. The average noise levels and sources of noise measured at each location are identified in Table 3.10-4. The recorded daytime noise levels are characteristic of a low -density, suburban residential area with no close exposure to heavily traveled roadways. Noise measurements were taken on Wednesday, September 16, 2020, at mid-day to sample average ambient noise levels likely to occur during construction of the project.

Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication and can cause physiological and psychological stress and hearing loss. Given these effects, some land uses are considered more sensitive to noise levels than others due to the duration and nature of time people spend at these uses. In general, residences are considered most sensitive to noise as people spend extended periods of time in them including the nighttime hours. Therefore, noise impacts to rest and relaxation, sleep, and communication are highest at residential uses. Schools, hotels, hospitals, nursing homes, and recreational uses are also considered to be more sensitive to noise as activities at these land uses involve rest and recovery, relaxation, and concentration and increased noise levels tend to disrupt such activities. Places such as churches, libraries, and cemeteries, where people tend to pray, study, and/or contemplate, are also sensitive to noise, but due to the limited time people spend at these uses, impacts are usually tolerable. Commercial and industrial uses are considered the least noise sensitive.

Sensitive land uses within 1,000 feet of the project area include single family residences along the left and right banks of Corte Madera Creek, Ross Common Park, Frederick Allen Park, Ross Elementary School, Kentfield Hospital, Adaline E. Kent Middle School, and the College of Marin. Residences are generally located within 50 feet of the channel in Units 4 and 3. Ross Elementary School and Adaline E. Kent Middle School are approximately 485 feet and 543 feet from the nearest project elements, respectively. College of Marin borders Corte Madera Creek, within 50 feet of the project area. Kentfield Hospital is located approximately 61 feet from the project area. The sensitive land uses and associated receptors within 1,000 feet of the project area are shown in Figure 3.10-3 and summarized in Table 3.10-5.

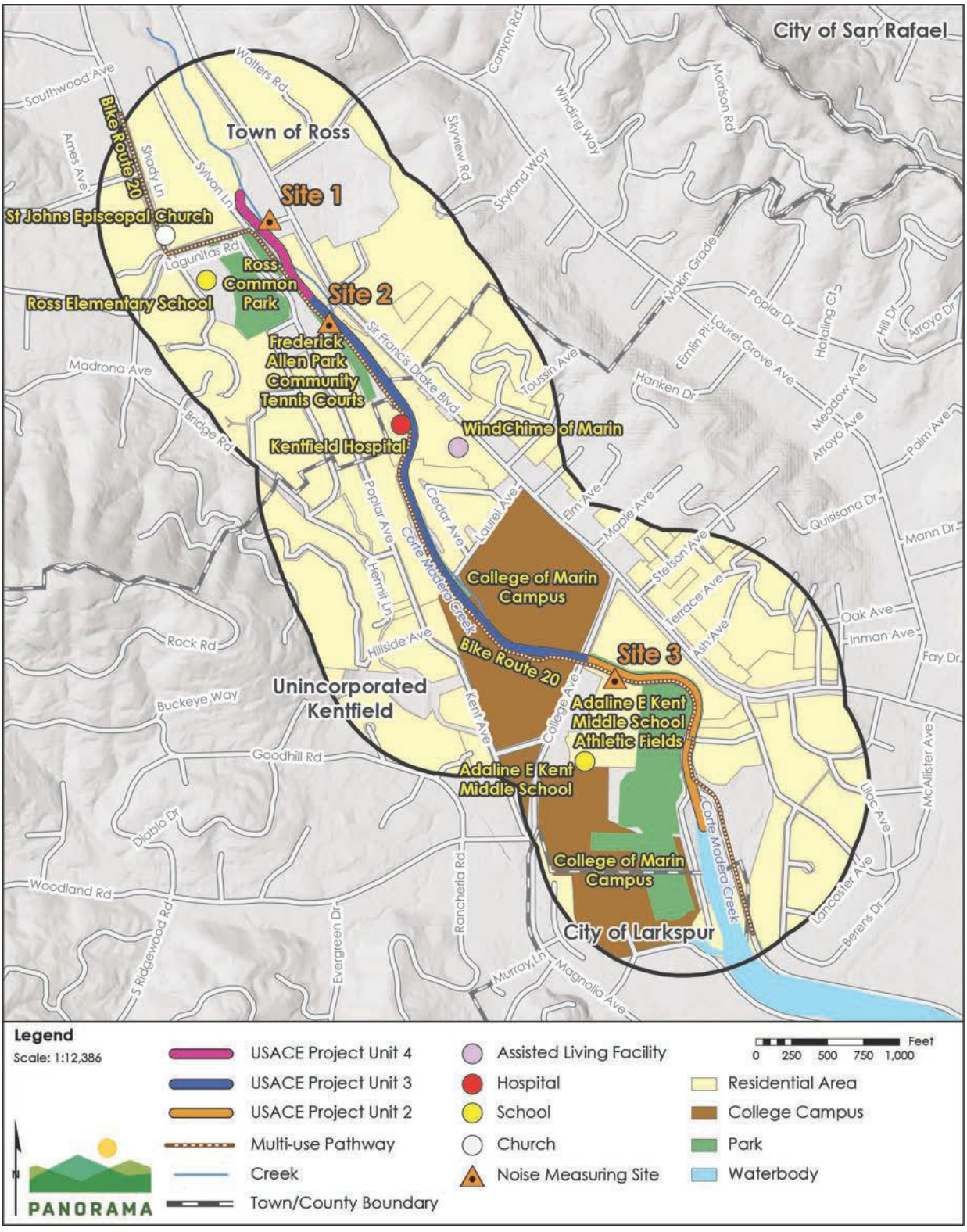
Table 3.10-4 Ambient Noise Levels at Noise Monitoring Locations

Measurement Location	L_{min}, dBA	L_{90}, dBA	L_{eq}, dBA	L_{10}, dBA	L_{max}, dBA	Noise Sources
Site 1: Near Ross Town Hall, adjacent to Lagunitas Road	45.9	53.5	62.9	66.7	76.6	Traffic passing on Lagunitas Road (adjacent to and south of the monitor), especially when queuing for left turn onto Sir Francis Drake Boulevard, is most influential; Sir Francis Drake traffic
Site 2: Frederick Allen Park; Creekside bicycle path	42.2	46.6	51.8	53.9	59.8	Traffic passing on Sir Francis Drake Boulevard (about 150 feet north) is most influential; passing walkers, runners, and bicyclists
Site 3: Creekside bicycle path, north of athletic fields at middle school	40.2	42.4	46.3	48.5	57.4	Distant traffic passing on Sir Francis Drake Boulevard (about 400 feet north) is most influential; passing walkers, runners, and bicyclists

Note:

[a] L_{eq} is a constant sound level that carries the same sound energy as the actual time-varying sound over the measurement period. L_{min}, L_{90}, L_{10}, and L_{max} are the minimum sound level, the sound level exceeded 90% of the time, the sound level exceeded 10% of the time, and the maximum sound level, respectively, all as recorded during measurement periods of 10-minute duration.

Figure 3.10-3 Noise Measuring Sites and Sensitive Receptors within 1,000 Feet of the Project Area



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, US Geological Survey 2013, Esri, United States Geological Survey, U.S. Geographic Names Information System 2020)

Table 3.10-5 Sensitive Receptors within 1,000 Feet of the Project Area

Project Unit	Sensitive Land Use	Nearest Sensitive Receptor Location
Unit 4	Church, school, residences	• Residential properties directly abut the construction area and are above the creek. • Ross Elementary School is approximately 485 feet west of the proposed Grading Transition Area in Unit 4. • St. John's Episcopal Church is approximately 560 feet west of the proposed Grading Transition Area in Unit 4. • Ross Common Park is approximately 80 feet west of the proposed Grading Transition Area in Unit 4.
Unit 3	Hospital, assisted living facility, school, college campus, residences	• Residences directly abut the proposed grading area and floodwall on the east side of Fredrick Allen Park. • Residential properties directly abut the proposed floodwalls in lower Unit 3 • There are residences located approximate 35 feet west of the channel where the new fish pools and floodwall will be located in Lower Unit 3. • Kentfield Hospital is approximately 61 feet west of the channel where the new fish pools and floodwall will be located in Unit 3. • College of Marin campus is adjacent to the proposed floodwall and stormwater pump station in Unit 3 from Laurel Avenue to College. • Wind Chime of Marin (assisted living facility) is approximately 306 feet east of the channel where the new fish pools and floodwall will be located in Unit 3.
Unit 2	School, college campus, residences	• There is a college campus building located approximately 46 feet northwest of the proposed Unit 2 floodwall. • The proposed Unit 2 floodwall abuts residential properties. • Adaline E. Kent Middle School is located approximately 543 feet west of the proposed Unit 2 floodwall.

3.10.5 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

Federal Regulations

Truck Operations

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 CFR, Part 205, Subpart B. The federal truck pass-by noise standard is 80 dBA at 15 meters (approximately 50 feet) from the vehicle pathway centerline. These limits are implemented through regulatory controls on truck manufacturers.

Occupational Safety and Health Administration

The Occupational Safety and Health Administration aims to ensure worker safety and health in the United States by working with employers and employees to create better working

environments. With regard to noise exposure and workers, Occupational Safety and Health Administration regulations set forth accepted criteria to protect the hearing of workers exposed to occupational noise. Noise exposure regulations are listed in 29 CFR Section 1910.95. Most applicable to the project, 1910.95(c)(1) states that an employer shall administer a hearing conservation program whenever noise exposure levels equal or exceed an eight-hour time-weighted average sound level of 85 dBA.

State Regulations

California Government Code Section 65302 encourages each local government entity to implement a noise element as part of its general plan. In addition, the California Governor's Office of Planning and Research has developed guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure. According to the guidelines, exterior noise exposures generally fall into three categories: normally acceptable, conditionally acceptable, and unacceptable. Each land use has a particular dBA range within each exterior noise exposure category. For residential uses, an exterior noise environment of less than 62.5 dBA L_{dn} or CNEL is considered "normally acceptable" while a noise environment of 62.5 to 77.5 dBA L_{dn} or CNEL is considered "conditionally acceptable." For neighborhood parks, the General Plan guidelines indicate that an exterior noise environment of less than 65 dBA L_{dn} or CNEL is considered "normally acceptable," between 65 dBA and 80 dBA L_{dn} or CNEL is considered "conditionally acceptable," and 80 dBA or greater is considered "unacceptable."

Regional and Local Regulations

Marin County Municipal Code

The Marin County Code stipulates the following regulation for construction-related noise:

Section 6.70.030 – Enumerated Noises.

(5) Construction Activities and Related Noise.

a. Hours for construction activities and other work undertaken in connection with building, plumbing, electrical, and other permits issued by the community development agency shall be limited to the following:
   i. Monday through Friday: seven a.m. to six p.m.
   ii. Saturday: 9 am to 5 pm
   iii. Prohibited on Sundays and Holidays (New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day.)

b. Loud noise-generating construction-related equipment (e.g., backhoes, generators, jackhammers) can be maintained, operated, or serviced at a construction site for permits administered by the community development agency from eight a.m. to five p.m. Monday through Friday only.

c. Special exceptions to these limitations may occur for:

i. Emergency work as defined in Section 22.130.030 of this code provided written notice is given to the community development director within forty-eight hours of commencing work;
ii. Construction projects of city, county, state, other public agency, or other public utility;
iii. When written permission of the community development director has been obtained, for showing of sufficient cause;
iv. Minor jobs (e.g., painting, hand sanding, sweeping) with minimal/no noise impacts on surrounding properties; or
v. Modifications required by the review authority as a discretionary permit condition of approval.

Marin Countywide Plan

The Built Environment Element of the Marin Countywide Plan contains the following goal, policy, and implementing program that relates to noise and is applicable to the project (Marin County , 2007).

Goal NO-1: Protection from Excessive Noise. Ensure that new land uses, transportation activities, and construction do not create noise levels that impair human health or quality of life.

Policy NO-1.3: Regulate Noise Generating Activities. Require measures to minimize noise exposure to neighboring properties, open space, and wildlife habitat from construction-related activities, yard maintenance equipment, and other noise sources, such as amplified music.

Implementing Program NO-1.i: Regulate Noise Sources - Sections 6.70.030(5) and 6.70.040 of the Marin County Code establish allowable hours of operation for construction-related activities. As a condition of permit approval for projects generating significant construction noise impacts during the construction phase, construction management for any project shall develop a construction noise reduction plan and designate a disturbance coordinator at the construction site to implement the provisions of the plan.

Town of Ross Municipal Code

The following code of the Town of Ross Municipal Code related to noise is applicable to the project (Town of Ross, 2020).

Chapter 9.20 Unnecessary Noise

9.20.035 Construction. (a) It is unlawful for any person or construction company within the town limits to perform any construction operation before eight a.m. or after five p.m., Monday through Friday of each week and not at any time on Saturday, Sunday, or the other holidays listed in Section 9.20.060.

Town of Ross General Plan
The following goal and policy of the Ross General Plan related to noise is applicable to the project.

Goal 5. Protecting Community Health and Safety, and Preparing for Emergencies.

> **5.10 Traffic and Construction Noise**. Require mitigation of construction and traffic noise impacts on the ambient noise level in the Town.

3.10.6 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it would result in one or more of the following:

a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
b. Generation of excessive groundborne vibration or groundborne noise levels.
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, the project would expose people residing or working in the project area to excessive noise levels.

Approach to Impact Analysis

The following analysis discusses the significant impacts of the project related to noise and vibration. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.10.7 Impact Discussion

Impacts Avoided

Due to the nature of the project, there would be no impacts related to the following criteria; therefore, no impact discussion is provided for the reasons described below:

1. **Criterion (c).** The project is not located within an airport land use plan, and the nearest public airport, the Gnoss Field Airport in Novato, is located approximately 12 miles from the project. The nearest private airport, the San Rafael Airport in San Rafael, is located approximately 4 miles from the project. Therefore, the project would not result in any airport-operations-related safety hazard for people residing or working in the project area.

Impacts Analyzed

	Significance Determination
Impact 3.10-1: The project could 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.	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: Less than Significant

Construction

The project is located in a suburban residential area. Noise sources in the project vicinity include vehicle traffic on Sir Francis Drake Boulevard, Lagunitas Road, and College Avenue (approximately 120 feet east of upper Unit 3, crossing Unit 4, and crossing where Units 2 and 3 meets, respectively); traffic along adjacent roadways; and passing walkers, runners, and bicyclists along Bike Route 20. Construction of the project would temporarily generate noise during the seven months of active construction. Construction activities would occur on weekdays between the hours of 8:00 a.m. and 5:00 p.m. No nighttime or weekend construction activities would occur as part of the project.

Construction noise is regulated by the Town of Ross and Marin County Municipal Codes. Town of Ross Municipal Code Section 9.20.035 and Marin County Municipal Code Section 6.70.030(c) outline the allowable construction hours within each jurisdiction. Table 3.10-6 below lists the hours and times when construction is allowed in each jurisdiction.

Table 3.10-6 Town of Ross and Marin County Municipal Code Construction Requirements

Jurisdiction	Weekdays	Saturdays	Sundays	Federal Holidays
Marin County	8:00 a.m. to 5:00 p.m.	Construction not allowed	Construction not allowed	Construction not allowed
Town of Ross	8:00 a.m. to 5:00 p.m.	Construction not allowed	Construction not allowed	Construction not allowed

Project construction would require heavy equipment, including graders, excavators, cranes, dump trucks, and smaller equipment to transport materials, clear vegetation, grade new work areas, and remove and install floodwalls.

Table 3.10-7 lists the equipment that would be used during construction and the associated noise levels at a reference distance of 50 feet from the noise source.

Construction phase noise levels are modeled using a national model and construction equipment database in the Roadway Construction Noise Model (RCNM) from the Federal Highway Administration (FHWA). A list of construction equipment anticipated to be used during each construction phase is provided in Table 3.10-7. Construction noise is calculated for each phase of construction using noise-generating equipment that could be operating simultaneously within the work sites. The results are the sum of noise levels that would be experienced by typical receptors at a given distance. Construction noise levels are estimated at 50 feet, 100 feet, and 200 feet from the construction work area. Table 3.10-8 shows the

equipment required for work during each construction phase and the estimated L_{eq} and L_{max} at 50, 100, and 200 feet.

Compliance with Noise Standards and Ordinances by Project Element

Unit 4 and Frederick Allen park Construction

The ambient noise levels in Unit 4 and at residences adjacent to Frederick Allen Park on Sir Francis Drake Boulevard is approximately 62.9 dBA L_{eq} (Table 3.10-4). Both Unit 4 and Frederick Allen Park are located within the Town of Ross where the Town of Ross Municipal Code and General Plan construction noise standards would apply. Construction noise would be generated during daytime hours (8 a.m. to 5 p.m.) when construction noise is exempt under the Town of Ross Municipal Code 9.20.035. The project would not conflict with Town of Ross Municipal Code due to the daytime construction period.

Project construction activities would generate noise that would result in a temporary increase in the ambient noise level to a maximum of 84.9 dBA L_{eq} at 50 feet for a period of a few days during concrete removal and 81.1 dBA to 81.4 dBA L_{eq} during other construction activities (Table 3.10-8). The Town of Ross General Plan requires mitigation for construction noise impacts when construction noise substantially exceeds the ambient noise level. The temporary increase in noise levels during construction in Unit 4 and at Frederick Allen park would be substantial (greater than 10 dBA) and therefore significant and require mitigation in accordance with the Town of Ross General Plan.

Table 3.10-7 Maximum Noise Levels Generated by Construction Equipment

Equipment	L_{max} (dBA) at 50 feet
Boom truck/cherry picker[a]	85
Concrete truck and boom pump[b]	82
Concrete saw	90
Crane	85
Drill[c]	85
Dump trucks	84
Excavator (small and medium)	85
Flatbed trucks	84
Generators	82
Air compressors	80
Grader	85
Jackhammer	85
Hoe Ram	90
Loader[d]	80

Equipment	L_{max} (dBA) at 50 feet
Pickup trucks (small and large)	55
Pump	77
Roller/Compactor	85
Paver	85
Silent piler[e]	Less than 62

Notes:

[a] Crane is used to represent noise from a boom truck/cherry picker.

[b] Concrete pump truck is used to represent noise from a concrete truck and boom pump.

[c] Auger drill rig is used to represent noise from a drill.

[d] Front-end loader is used to represent noise from a loader.

[e] Noise level is estimated to be 61.5 dBA at 16 meters (52 feet) with eco mode on.

Source: (FHA, 2017; Giken, n.d.)

Table 3.10-8 Estimated Noise from Equipment Required for Construction Phases

Construction Phase	Equipment	Distance from Construction Work Area	L_{eq} (dBA)	L_{max} (dBA)
Concrete channel removal	Excavator, loader, hoe ram[a], dump truck	50	84.9	90.3
		100	78.9	84.3
		200	72.9	78.2
Bank stabilization Floodwall installation	Excavator, concrete pump, cement truck, compressor	50	81.1	81.4
		100	75.1	75.4
		200	69.0	69.4
Habitat enhancement Fish ladder removal Fish pools construction	Excavator, loader, concrete pump, cement truck	50	81.4	81.4
		100	75.4	75.4
		200	69.3	69.4
Pump station construction	Crane, drill, concrete pump, cement truck, compressor	50	81.9	84.4
		100	75.9	78.3
		200	69.8	72.3

[a] It is assumed that a hoe ram could be used to remove concrete instead of a jackhammer. A hoe ram has a noise level of 90 dBA at 50 feet, which is higher than a jackhammer (85 dBA at 50 feet). Therefore, a hoe ram is used to conservatively estimate noise from concrete channel removal activity.

Source: (FHWA, 2017).

The District would implement **Mitigation Measure 3.10-1: Construction Noise Reduction Plan** to reduce noise levels and impacts. Mitigation Measure 3.10-1 specifies the requirements of the noise-reduction plan, including notification of nearby residents and use of noise barriers to reduce noise levels at adjacent sensitive receptors. Barriers that are correctly placed and well-designed would be expected to reduce construction equipment noise levels by 9 to 10 dBA. The maximally affected receptors are residents living adjacent to Frederick Allen Park, where concrete removal would occur for a few days and grading and heavy equipment use would last up to seven months. Residents adjacent to Frederick Allen Park and Unit 4 are located on Sir Francis Drake Boulevard. Ambient noise levels on Sir Francis Drake Boulevard are similar to, and likely higher than, the noise levels on Lagunitas Road due to the higher volume of traffic on Sir Francis Drake Boulevard. With implementation of Mitigation Measure 3.10-1, construction noise levels would be reduced approximately 9 to 10 dBA. Because Mitigation Measure 3.10-1 includes noise reduction measures that would reduce the noise impact on ambient noise levels in the Town of Ross, the construction noise would be consistent with the Town of Ross General Plan requirements and the impact would, therefore, be less than significant with mitigation.

Lower Unit 3 and Unit 2 Construction Floodwalls and Fish Pools

Lower Unit 3 and Unit 2 construction areas are located within Marin County where the Marin County Municipal Code and Countywide Plan noise standards would apply. The Marin County Municipal Code allows for construction noise during the hours of 8 a.m. to 5 p.m. Monday through Friday. All construction would occur during these hours and would not conflict with the noise standards in the municipal code. The Marin Countywide Plan requires preparation of a noise reduction plan for projects generating significant construction noise. Installation of floodwalls and construction of eleven larger fish pools in lower Unit 3 and Unit 2 would proceed along the channel in a linear fashion. While the overall duration for installation of the three segments of floodwall and construction of fish pools would last several weeks, construction in each area would last a few days. The impacts from floodwall installation and fish-pool construction noise would be less than significant due to the very short duration of construction near each sensitive receptor.

Stormwater Pump Station

The proposed stormwater pump station would be located approximately 100 feet from the nearest residential structure or College of Marin buildings. Construction of the stormwater pump station would occur between 8 a.m. and 5 p.m. Monday through Friday and would not conflict with the noise requirements in the Marin County Municipal Code. Noise levels from stormwater pump station construction would be approximately 75.9 dBA L_{eq} at a distance of 100 feet during daytime construction hours (8 a.m. to 5 p.m.). Ambient noise levels at the stormwater pump station are likely slightly less than at Lagunitas Road (62.9 dBA L_{eq}) because the stormwater pump station is removed form Frederick Allen Park but is subject to traffic, including traffic to the adjacent College of Marin. Construction of the stormwater pump station would result in a substantial increase in ambient noise levels (greater than 10 dBA) at nearby sensitive receptors during daytime hours for up to six weeks. The increase in noise would be significant. Because the Countywide Plan requires implementation of a noise reduction plan for projects that generate significant construction noise, and the project would generate significant

construction noise, the impact would be significant. The District would implement **Mitigation Measure 3.10-1: Construction Noise Reduction Plan** to reduce noise levels and impacts. Mitigation Measure 3.10-1 requires preparation of a noise reduction plan that includes notification of nearby residents and use of noise barriers to reduce noise levels at adjacent sensitive receptors. Preparation of the noise reduction plan consistent with Mitigation Measure 3.10-1, would reduce significant construction noise and would comply with the Countywide Plan. The impact from temporary construction noise generation at the stormwater pump station would, therefore, be less than significant with mitigation.

Lower Corte Madera Creek Concrete Channel Removal

The concrete channel removal in Unit 2 would require construction for up to six weeks. Dewatering would require installation of sheet piles. The sheet piles would be installed with a silent piler that would generate noise levels up to 62 dBA. The nearest sensitive receptors are located approximately 500 feet from the construction area. Construction activities in the area could generate noise up to 63 dBA L_{eq} at the nearest receptors on Sir Francis Drake Boulevard. The temporary noise at sensitive receptors would be similar to ambient noise levels from traffic on Sir Francis Drake Boulevard, and the project would not cause a substantial increase in noise levels; therefore, the impact would be less than significant.

Construction Traffic Noise

In addition to on-site construction noise, off-site hauling and material deliveries associated with construction activities would occur along designated truck routes within the project vicinity. This increase in truck traffic compared to existing conditions would contribute incrementally to traffic noise along local streets. Truck noise levels depend on vehicle speed, load, terrain, and other factors. The effects of off-site truck noise would depend on the existing level of background noise at a particular sensitive receptor. It is anticipated that a maximum day of truck traffic from the project area would result in 93 one-way trips per day during fish-pool construction and activities at Frederick Allen Park. Several phases have overlapping construction time periods that could result in a higher number of peak daily truck trips of up to approximately 413 one-way trips accessing the project area. Worker travel to and from the construction site would account for a maximum of 20 one-way trips per day. Accounting for the overlap of construction phases, peak one-way worker trips could be up to 112 per day.

Haul truck routes would likely occur along U.S. Highway 101, Sir Francis Drake Boulevard, and other local roadways in the immediate vicinity of the project area. Noise associated with a single truck pass-by can be approximately 80 dBA at 50 feet (FHWA, 2006). However, it takes a doubling of traffic to increase average noise levels by only 3 dB, which is considered barely perceptible to the average person (Caltrans, 2013a). Since U.S. Highway 101 and the majority of Sir Francis Drake Boulevard experience elevated traffic levels, the worst-case worker and haul truck traffic of 525 one-way trips per day would not double traffic volume along these roadways and would therefore not result in a perceptible increase in traffic noise at existing sensitive receptor locations. The impact associated with traffic noise would be less than significant.

Operation and Maintenance

Operation and maintenance activities would generally be similar to existing conditions except for operation of the proposed stormwater pump station and testing of the new backup generator. Typical activities include sediment and debris removal, vegetation management, and regular inspection and as-needed repair of floodwalls or other structures. These activities may include the use of offroad equipment such as lawn mowers, backhoes, and loaders. The pumps for the stormwater pump station would be installed underground and are not anticipated to create perceptible noise at the nearest receptor. The pumps would only be operational during and immediately following storm events when creek levels exceed the height of the outfall pipe and the stormwater pump station is needed to avoid flooding. Power for the stormwater pump station will primarily be provided by a connection to the grid. A generator would also provide emergency backup power in the case of power failure when the stormwater pump station needs to operate. Operation of the backup generator would only occur during emergencies and during testing of the generator. Operation and maintenance activities for the project would be temporary and occur infrequently throughout the year and would not result in a permanent increase in noise; therefore, impacts would be less than significant.

Mitigation: Implement Mitigation Measure 3.10-1.

Mitigation Measure 3.10-1: Construction Noise Reduction Plan. The District would adhere to this requirement and develop a construction noise reduction plan in compliance with local regulations to include measures to reduce construction noise impacts. These measures shall include, but not be limited to, the following:

1. Distribute to the potentially affected residences and other sensitive receptors within 200 feet of project construction boundary a "hotline" telephone number, which shall be attended during active construction working hours, for use by the public to register complaints. The distribution shall identify a noise-disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints and institute feasible actions warranted to correct the problem. All complaints shall be logged noting date, time, complainant's name, nature of complaint, and any corrective action taken. The distribution shall also notify residents adjacent to the project area of the construction schedule.
2. All construction equipment shall have intake and exhaust mufflers recommended by the manufacturers thereof. Further, pavement breakers and jackhammers shall also be equipped with acoustically attenuating shields or shrouds recommended by the manufacturers thereof. In lieu of or in the absence of manufacturers' recommendations, the Director of Public Works shall have the authority to prescribe such means of accomplishing maximum noise attenuation as he deems to be in the public interest, considering the available technology and economic feasibility.

3. Maintain maximum physical separation between noise sources (construction equipment) and sensitive noise receptors. Separation may be achieved by locating stationary equipment to minimize noise impacts on the community.
4. Impact tools (e.g., jack hammers) used during construction activities will be hydraulically or electrically powered where feasible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used.
5. Use construction noise barriers such as paneled noise shields, barriers, or enclosures adjacent to noisy stationary equipment such as generators, air compressors, jackhammers, etc. Noise control shields shall be made featuring a solid panel and a weather-protected, sound-absorptive material on the construction-activity side of the noise shield.

Significance after Mitigation: Implementing Mitigation Measure 3.10-1 would comply with the Town of Ross General Plan and Countywide Plan. The mitigation would reduce construction noise levels by requiring use of equipment that would reduce noise generation and use of sound barriers to reduce noise at sensitive receptors. The impact would be less than significant after mitigation.

	Significance Determination
Impact 3.10-2: The project would not result in generation of excessive groundborne vibration or groundborne noise levels.	**Construction: Less than Significant with Mitigation** **Operation and Maintenance: Less than Significant**

Overview

The Marin Countywide Plan and Town of Ross General Plan and relevant municipal codes do not address vibration or provide numerical thresholds for identifying groundborne vibration impacts. In the absence of local standards for construction equipment vibration, the evaluation presented below uses the vibration thresholds presented in Table 3.10-9 to assess the significance of groundborne vibration and noise impacts. For risk of architectural damage to historic buildings and structures, this analysis applies a threshold of 0.12 in/sec PPV (Caltrans, 2013b). The only historic structures located in proximity to the project include Lagunitas Bridge and Ross Town Hall, north of the Unit 4 construction area and beyond the limits of vibration effects from the project. A threshold of 0.3 in/sec PPV is used for all other buildings. The FTA provides an equation that may be used to estimate vibration at different distances based on a reference PPV of 25 feet (Table 3.10-10) for various construction equipment. Using the FTA equation, the distances at which vibration-generating construction equipment would be lower than the damage thresholds were calculated and compared to potential distances to receiving buildings.

Table 3.10-9 Vibration Thresholds

	Maximum Peak Particle Velocity (PPV), inches per section (in/sec)
Historic buildings and structures	0.12
All other structures	0.3

Note:

The vibration criteria are based on continuous or frequent intermittent sources, including impact pile drivers, compactors, crack and seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: (Caltrans, 2013b).

Table 3.10-10 Vibration Velocities for Construction Equipment

Equipment	Reference PPV at 25 feet (in/sec)	PPV at 5 feet (in/sec)	PPV at 30 feet (in/sec)
Large bulldozer[a]	0.089	0.523	0.073
Small bulldozer[b]	0.003	0.018	0.002
Jackhammer	0.035	0.206	0.029
Hoe ram	0.24	1.41	0.196
Loaded Trucks	0.076	0.446	0.062
Caisson Drilling	0.089	0.523	0.073
Silent piler[c]	0.05	0.294	0.041

Notes:

[a] Large bulldozer is used to represent vibration velocity for a medium excavator.

[b] Small bulldozer is used to represent vibration velocity for a small excavator.

[c] No vibration data are available for silent piler. Vibration data from the Fundex Tubex piling system were used to model vibration level as a "worst-case scenario" of pile installation vibration.

Source: (FTA, 2006).

Construction

Temporary sources of groundborne vibration during construction would result from operation of conventional heavy construction equipment such as an excavator, loaded haul trucks, and a jackhammer or hoe ram.

The nearest structures to the project are located approximately 30 to 60 feet from the project elements, with the exception of buildings located directly west of Frederick Allen Park. The nearest structure at Frederick Allen Park is located approximately three feet to the west of proposed floodwall. Table 3.10-10 summarizes typical vibration levels generated by heavy equipment applicable to the project at five feet and 30 feet distances. Assuming that a large

bulldozer[1] would be used during project construction, structures would be exposed to a vibration level of 0.029 in/sec at 30 feet from construction area. Structures in all project elements, except adjacent to Frederick Allen Park, would not be exposed to vibration levels that would exceed the established building damage threshold (0.3 in/sec) since the nearest structures are located at least 30 feet away from the construction area.

Grading activities and construction of the short floodwall in Frederick Allen Park could occur at as close as three feet from buildings. A large bulldozer would produce a PPV of 0.523 at five feet, and a loaded truck would produce a PPV of 0.446 at five feet (Table 3.10-10); these vibration levels exceed the threshold of 0.3 PPV, and the vibration impact is therefore significant. **Mitigation Measure 3.10-2 Vibration Reduction Measures** would reduce potentially significant impacts by requiring vibration monitoring during construction activities in Frederick Allen Park adjacent to buildings and requiring notification to residents and property owners of vibration-generating activity and potential consequences. Because the mitigation requires monitoring and specifies procedures to avoid exceeding the vibration threshold, groundborne vibration impacts would be less than significant with mitigation.

Operation and Maintenance

Operation and maintenance activities would generally be similar to existing conditions except for operation of the proposed pump station and testing of the new backup generator, including sediment and debris removal, vegetation management, and regular inspection and as-needed repair of floodwalls or other structures. These activities would be temporary and may include the use of off-road equipment such as lawn mowers, backhoes, and loaders. These activities would occur at a greater distance from the nearest sensitive receptors than the construction. It is anticipated the vibration levels that occur during operation and maintenance activities would not exceed the established adverse human reaction threshold or the building damage threshold; therefore, this would result in a less-than-significant impact.

> **Mitigation:** Implement Mitigation Measure 3.10-2.
>
> **Mitigation Measure 3.10-2: Vibration Reduction Measures.** The District shall design the project to avoid intense vibration activities within five feet of the structures at Frederick Allen Park (e.g., avoid use of large bulldozer, jackhammer, hoe ram, or loaded trucks). If intense vibration generating activities cannot be avoided in proximity to structures, vibration monitoring shall be conducted during grading and floodwall construction activities in Frederick Allen Park to confirm vibration levels do not exceed vibration thresholds at the nearest receptors. If vibration levels approach the threshold of 0.3 PPV at the nearest structure, then construction practices shall be modified (i.e., use

[1] Vibration data are not available for excavator. Vibration data from bulldozer were used to model vibration level for excavator.

smaller types of construction equipment, operate the equipment in a manner to reduce vibration, or use alternate construction methods) so that the threshold is not exceeded.

Significance after Mitigation: Implementing Mitigation Measure 3.10-2 would reduce significant vibration impacts to a less-than-significant level by requiring the District implementation to avoid intense vibration in proximity to structures.

3.10.8 References

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3.11 Public Services

3.11.1 Introduction

This section describes existing public services in the vicinity of the project and evaluates the potential impacts of the project on public services (including fire and emergency, police and criminal justice, and public education services). Potential effects on parks as a public service are addressed in Section 3.12 Recreation. Similarly, Section 3.13 Transportation and Circulation, evaluates potential impacts regarding emergency access during construction. No scoping comments relevant to evaluation of public services were provided during the public scoping period.

3.11.2 Scoping Comments

Comments related to public services impacts were received during the public scoping process. These comments and the location where they are addressed in the public services analysis are provided in Table 3.11-1.

Table 3.11-1 Public Services Scoping Comments

Agency/Entity	Comment	Location in Public Services Section that Comment is Addressed
Garrill Page	Biking has become more and more popular form of recreation and for some people, of transportation. Unfortunately, the increase in popularity has meant increases in heedless behavior, traffic violations and increased speed that endangers pedestrians. Upgrading the multi-use path encourages greater use and abuse, requires more regulation, increased supervision, and added demands on Town staff and services as well as less privacy for town residents. The lengthy period of construction for the FAP Riparian corridor increases traffic disruption and inconvenience for Ross residents and drivers on SFD.	Section 3.11.6, Impact 3.11-1

3.11.3 Environmental Setting

Fire Protection and Emergency Services

The project is located within the Town of Ross and unincorporated Kentfield and would be serviced by the Ross Valley Fire Department (RVFD), Kentfield Fire Protection District (KFPD), and Marin County Fire Department. Unit 4 and upper Unit 3 are located in the Town of Ross and serviced by the RVFD. Lower Unit 3 and Unit 2 are located in unincorporated Kentfield and serviced by KFPD and the Marin County Fire Department. All RVFD and KFPD fire stations

could respond to fire and other needs for emergency services in either jurisdictional area, as needed.

Ross Valley Fire Department

The RVFD service area encompasses the Towns of San Anselmo, Ross, and Fairfax as well as the unincorporated Sleepy Hollow community. The Department provides fire suppression, emergency medical services, fire prevention and inspection, community education, hazardous material spill response, specialized rescue, and vehicle collision response and disaster response to its service area and neighboring areas of Marin County (RVFD, 2020)**.**

The RVFD has four fire stations within approximately 2.5 miles of the project. Fire Station 18 is located at 33 Sir Francis Drake Boulevard in Ross, approximately 0.2 mile from the project area. The historic Ross Fire Station was built by the Town of Ross in 1926. Fire Station 18 houses the Ross Valley Paramedic Authority transport ambulance, Medic 18, staffed with two paramedic firefighters. The station houses one structural firefighting engine and a reserve fire engine, which can be staffed by off-duty and volunteer personnel as needed (RVFD, 2020).

Kentfield Fire Protection District

The KFPD is a special district formed under the authority of the California Health and Safety Code. The KFPD services the communities of unincorporated Greenbrae, Del Mesa, Kentfield proper and Kent Woodlands, which includes lower Unit 3 and Unit 2 (KFPD, 2019)..

The KFPD Station is located at 1004 Sir Francis Drake Boulevard, approximately 0.5 mile from the project area. The KFPD is a member of the California Inter- County Mutual-Aid Plan and the Marin County Automatic and Mutual-Aid Plan, covering emergencies and disasters such as fires, floods, mass-casualty incidents, and earthquakes. All KFPD personnel are certified Hazardous Materials First Responders and Emergency Medical Technicians. The KFPD provides paramedic service through the Ross Valley Paramedic Authority Joint Powers Agreement (KFPD, 2020).

Marin County Fire Department

The Marin County Fire Department serves the unincorporated portion of Marin County's 521 square miles, including lower Unit 3 and Unit 2 which lie within the community of Kentfield (Marin County Fire Department, 2020). The nearest station is the Marin City Station at 850 Drake Avenue, Marin City, approximately 5 miles southeast from the project site (County of Marin, 2020).

Police and Criminal Justice Services

The Town of Ross Police Department and Marin County Sheriff Department provide police protection services to the project area. Both the Town of Ross Police Department and Marin County Sheriff Department could respond to situations in either jurisdictional area, as needed.

Town of Ross Police Department

The Town of Ross Police Department is located at 33 Sir Francis Drake Boulevard, which is along the left bank of Unit 4 and north of Lagunitas Road. The Department provides police services to the Town of Ross and unincorporated Kentfield (Town of Ross, 2020).

Marin County Sheriff Department

The Marin County Sheriff Department serves the unincorporated portion of Marin County's 521 square miles, including lower Unit 3 and Unit 2 which lie within the community of Kentfield (Marin County Sheriff's Office, 2020). The Marin County Sheriff Department headquarters are located at 3501 Civic Center Drive in San Rafael and has three substations located in Kentfield, Point Reyes, and Marin City. The closest substation is at 831 College Avenue in Kentfield, approximately 0.5 mile from the project area. Each substation's area is divided into patrol subareas, which are served by uniformed deputies in marked patrol units. Additional patrol units are assigned during high activity periods as needed.

Public Education Services

The College of Marin Kentfield Campus is located at 835 College Avenue, Kentfield, directly adjacent to the left and right bank of Unit 2 and adjacent to the left bank of Unit 3 along Corte Madera Creek. The College of Marin is a public community college and had an enrollment of 13,460 students for the 2018-2019 academic year (College of Marin, 2019).

Kent Middle School is located at 800 College Avenue, with the school's athletic fields located adjacent to Unit 2. Kent Middle School serves grades 5 through 8, with an enrollment of 560 students in the 2019-2020 academic year (Kent Middle School, 2020).

Ross School is located at 9 Lagunitas Road, approximately 0.25 mile from the right bank of Unit 4. Ross School serves grades K through 8 with an enrollment of 394 students in the 2018-2019 academic year (Education Data Partnership, 2020).

There are two public libraries in the project vicinity. The Jose Moya del Piño Library is in the Octagon House at the Marin Art and Garden Center at 30 Sir Francis Drake Boulevard in Ross, approximately 400 feet from the left bank of Unit 4. San Anselmo Public Library, located at 110 Tunstead Avenue, San Anselmo, is located approximately 1 mile north of the project area.

3.11.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project and are defined as standard conditions for the project.

Federal Regulations

Although there are multiple federal laws, statutes, and regulations on public services that would generally apply to the project, the federal government and its agencies have delegated

the authority to implement and satisfy public service requirements to the state of California and its agencies, as discussed below.

State Regulations

California Master Mutual Aid Agreement

The California Master Mutual Aid Agreement is a framework agreement between the State of California and local governments for aid and assistance by the interchange of services and facilities, including but not limited to fire, police, medical and health, communication, and transportation services and facilities to cope with the problems of rescue, relief, evacuation, rehabilitation, and reconstruction. The California Master Mutual Aid Agreement provides funding for public services in the project area.

Regional and Local Regulations

Marin County Municipal Code

Chapter 16.16 Uniform Fire Code of the Marin municipal code establishes requirements for storage of flammable liquids and materials as well as the duties of the fire prevention bureau of the Marin County Fire Department.

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan are relevant to the public services that are serving the project area (Marin County , 2007).

Public Facilities and Services

Goal PFS-1: Adequate Public Facilities and Services. Provide basic public facilities to accommodate the level of development planned by cities and towns and the County.

Public Safety

Goal PS-1: Safe Neighborhoods. Ensure that county neighborhood remains safe places to live.

Goal PS-3: Effective Emergency and Disaster Preparedness. Provide proper emergency and disaster preparedness services through effective and coordinated emergency management plans and procedures.

> ***Policy PS-3.1: Plan Thoroughly for Emergencies.*** Ensure that the County, its citizens, businesses, and services are prepared for effective response and recovery in the event of emergencies or disasters.

3.11.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project could have a significant impact if it would:

a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:
   i. Fire protection
   ii. Police protection
   iii. Schools
   iv. Parks
   v. Other public facilities

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to public services for the project. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.11.6 Impact Discussion

Impacts Analyzed

Impact 3.11-1: The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services. i. Fire protection ii. Police protection iii. Schools iv. Parks v. Other public facilities	**Significance Determination**
	Construction: Less than Significant
	Operation and Maintenance: Less than Significant

Construction

Police and Fire Protection

Project construction would occur over a period of up to seven months and would employ an average of 8-10 construction workers per day. Construction workers likely would come from within Marin County and other Bay Area counties. Construction workers who are residents of Marin County are currently being served by the existing county and individual city/town services, and thus would not represent an increase in demand for these services. While it is possible that some workers might temporarily relocate from other areas, the project is not expected to result in a substantial increase in the local population (as described in Section 3.16 Agriculture and Forestry Resources, Mineral Resources, Land Use and Planning, Population and Housing, Wildfire, and Socioeconomics) and thus not expected to result in increased response times such that new or physically altered facilities would be required to maintain service. Incidents requiring law enforcement, fire protection, or emergency medical services could occur during construction. However, construction of the flood risk reduction project is not expected to generate a substantial increase in demand for these services. The construction would not require construction of new or physically altered facilities to maintain service. Therefore, the impact of project construction on fire and police services would be less than significant.

Schools

Temporary construction of the project would occur near schools in the project area, including immediately adjacent to the College of Marin and Kent Middle School and within 0.25 mile of Ross School. As described above, the project would not generate additional permanent employees or residents in the project area. Project construction is short-term in nature; therefore, it would not indirectly affect local schools as a result of employees moving into the area to work on the project. The concrete channel removal in lower Unit 2 would widen the channel and relocate and informal access path located on the left bank of Corte Madera Creek. The relocated access path would pass through a small portion of undeveloped land within College of Marin property. The relocated access path would not impact any College of Marin buildings or affect College of Marin operations because the relocated path would be located in an undeveloped area adjacent to the creek channel. Therefore, impacts to schools are considered less than significant.

Parks

As discussed in Section 3.12 Recreation, construction of the project would involve the temporarily closure of Frederick Allen Park including the Bike Route 20 within Unit 3. The public would not be able to access the park or pathway through the park during the construction period (up to seven months); however, access to the tennis courts would remain open. Bicyclists and walkers on the pathway would be redirected onto adjacent streets and detoured around the construction area. The detour would potentially reduce use of the pathway and temporarily increase use of other facilities. However, the detour would be short-term and pedestrian access would be restored following construction. Construction of the

project would not generate a need for new park facilities. The impact of project construction on parks would be less than significant.

Other Public Facilities

Project construction is short-term in nature; therefore, it would not indirectly affect nearby libraries as a result of employees moving into the area to work on the project. Construction of the project would not result in the need to construct new libraries or other public facilities and no impacts would occur. Therefore, impacts on other public facilities are considered less than significant.

Operation and Maintenance

Police and Fire Protection

The project does not involve the construction of residences or businesses and would not result in a permanent increase in the local population. During operation, project facilities would be unmanned and would not require a permanent workforce. The project is located in proximity to (and already served by) public services and would be constructed in accordance with all applicable current fire codes and public safety standards. Therefore, operation of the proposed project would not substantially increase the service population (or the number of service calls) within the area and would not necessitate the construction of a new police or fire station or alteration of an existing one in order to meet performance objectives. The project involves improvements along Corte Madera Creek to increase the capacity of the channel and reduce flooding in the Town of Ross and Kentfield areas. The project would also realign the Bike Route 20 multi-use path through Frederick Allen Park to provide access to the creek. Usage of Bike Route 20 is expected to be similar to existing conditions because the multi-use path is an existing pathway. Incidents requiring law enforcement or emergency services, or Town of Ross staff, are not expected to change compared to existing conditions. However, implementation of the proposed flood reduction measures (installing flood walls, stabilizing creek slopes, widening and removal portions of the concrete channel) would enhance safety along Corte Madera Creek and would likely reduce the number of service calls related to flooding emergencies, resulting in a beneficial impact to public services. Overall, the impact of project operation on fire and police services would be less than significant.

Schools

As discussed above, the project would not generate permanent employment and would not cause an increase in local population that would cause increased demand for local schools. The concrete removal in lower Unit 2 would create a new access path at the College of Marin. The new access path would be maintained by the Marin County Flood Control and Water Conservation District (District) and would not put additional demand on public schools. The impact would be less than significant.

Parks

The project includes modifications and alterations to Frederick Allen Park. The modifications to Corte Madera Creek and Frederick Allen Park would not generate additional demand for parks. The modified park would provide seating areas and a realigned pathway for continued

recreational use. The modified park would also allow for additional interaction with the creek through creek viewing areas and a pathway to the creek. The District would provide maintenance of the creek and pathway over the project life. The project would, therefore, not generate additional demand for park services or maintenance of park facilities; therefore, the impact would be less than significant.

Other Services

The project is proposed to provide enhanced flood risk reduction and stormwater management benefits to the communities of Kentfield and Ross. The project would have a beneficial impact on public stormwater and flood control services. The project would have no adverse effect on other public services.

Mitigation: None required.

	Significance Determination
	Construction: Less than Significant
Impact 3.11-2: The project would not result in the need for increased maintenance of public facilities, including roads.	**Operation and Maintenance: Less than Significant**

Construction

As described above in Impact 3.11-1, the project would not result in population growth and associated increased use of public facilities during construction. Construction of the project would last up to seven months and would employ an average of 8 to 10 construction workers per day who would not be expected to generate use or maintenance of public facilities. Heavy trucking activity is expected to occur during the material hauling and demolition phase of construction but would temporarily occur over the span of seven months. The haul trucks would not exceed the capacity of area roadways and would not have a long-term impact on the quality of the surrounding roadways. Impacts to public facilities and roads would be less than significant.

Operation and Maintenance

The project involves the construction of a new floodplain area within Frederick Allen Park, realignment of the pathway through the park, and construction of new retaining wall and floodwall segments along either side of the channel and at the margin of the park. The project elements that will be constructed are considered public facilities. The new floodplain area and realigned Corte Madera Creek are being designed to be sustainable. Limited maintenance other than vegetation management and inspections and maintenance of any erosion repairs is anticipated. The District is currently responsible for maintenance of the concrete channel and pathway within the park. The proposed concrete removal and channel modifications will be more resilient to seismic events and less at risk of long-term damage that would risk structural failure. The project will reduce the long-term risk of major maintenance actions to replace the concrete or other major structural maintenance such as reconstruction over time. The long-term impact from maintenance of the public facility will be less than significant.

Mitigation: None required.

3.11.7 References

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3.12 Recreation

3.12.1 Introduction

This section presents and discusses the potential for the project to adversely impact recreational facilities and activities in the project area. This section provides an overview of the environmental and regulatory setting that applies to recreational resources within the project area and presents and discusses potential project impacts and appropriate mitigation measures, as necessary.

3.12.2 Scoping Comments

Comments related to recreation impacts were received during the public scoping process. These comments and the location where they are addressed in the recreation analysis are provided in Table 3.12-1.

Table 3.12-1 Recreation Scoping Comments

Agency/Entity	Comment	Location in Recreation Section that Comment is Addressed
Michael Wanger	Will the pedestrian path between (a) the Flood Control access at the end of Locust Avenue and (b) the Kentfield Hospital Bridge be preserved?	Section 3.12.6, Impact 3.12-1
Michael Wanger	Will the foot path on the south side of the creek, which currently runs downstream from the Stadium Way footbridge, connect to the downstream section of the path as it does now? This is a major access way.	Section 3.12.6, Impact 3.12-1
Jeff Abend	Bike path is a critical artery for many people in the area. How will the bike path be impacted? Will it be closed at all?	Section 3.12.6, Impact 3.12-1
Marta Osterloh	What are the plans for recreational opportunity?	Section 3.12.6, Impact 3.12-1
Garril Page	Ross is distinguished by its trees: the high canopy overlays the town, creating a unique character immediately evident on entering Ross' shaded streets. FAP is Ross' urban forest, adjacent to a major arterial, yet a peaceful and relatively serene oasis on even the hottest days.	Section 3.12.6, Impact 3.12-3

3.12.3 Environmental Setting

Regional Setting

The project includes improvements to Corte Madera Creek within the Town of Ross and unincorporated Kentfield within Marin County.

The project is located within the Corte Madera Creek watershed, in which a varied range of recreational opportunities is available, including hiking, biking, picnicking, wildlife viewing,

sightseeing, field sports, and other public enjoyment opportunities. Recreational resources within the watershed serve Marin County and the greater Bay Area.

There are dozens of public parks in the watershed, including neighborhood parks, community parks and school playgrounds as well as over 5,700 acres of open space managed by the Marin County Open Space District and Marin Municipal Water District.

The Marin County Parks Department supports recreational opportunities at 34 open space preserves, four regional parks, and 27 community park facilities; three paved multi-use paths; a system of fire-protection roads and trails; recreational programs; environmental education programs; and volunteer programs. Parks in Marin County receive over two million visitors annually (Marin County Parks and Open Space Department, 2008).

Project Setting

Table 3.12-2 presents a list of parks and recreational facilities within these areas. Figure 3.12-1 shows the locations of the major parks, open space, and recreational facilities.

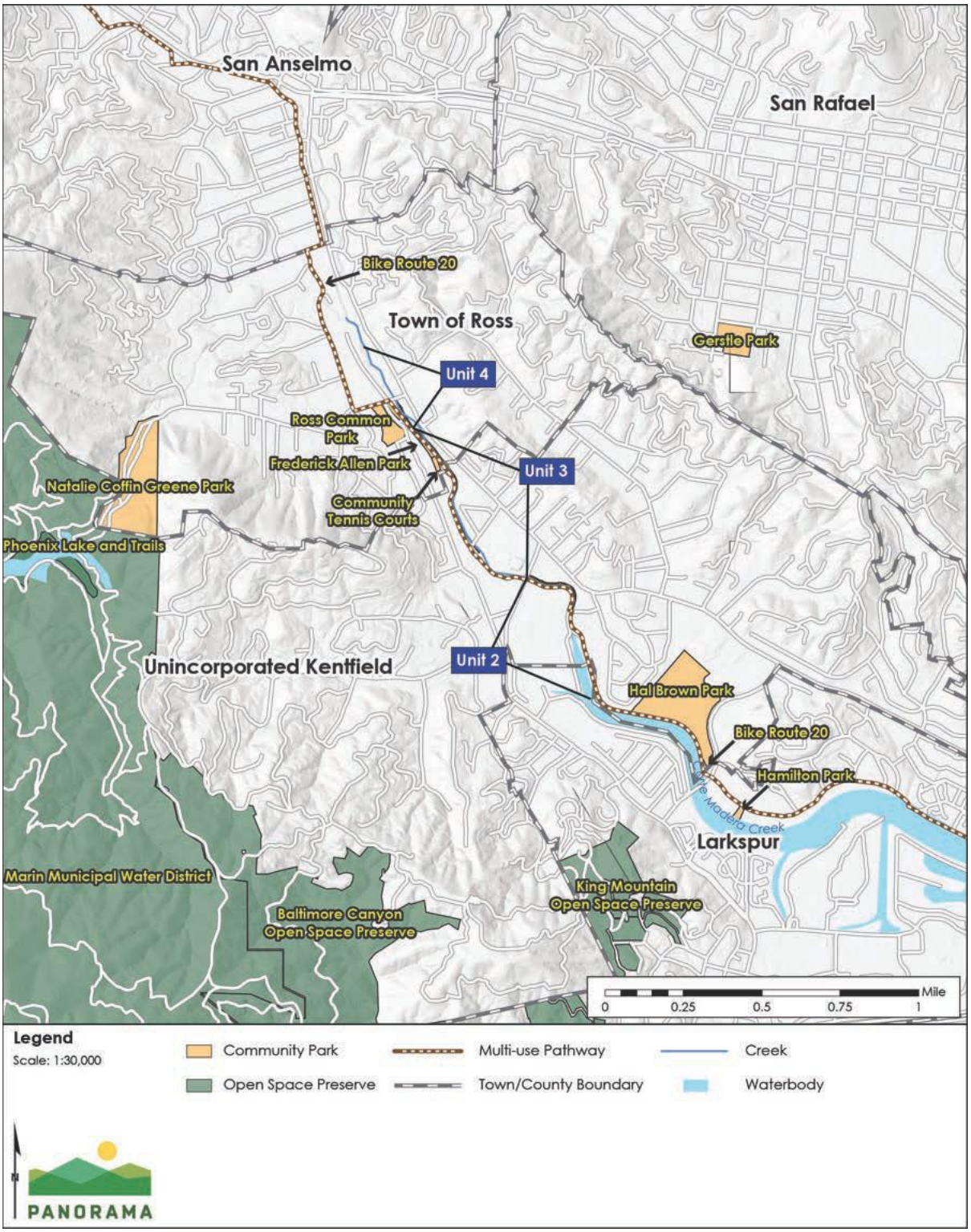
Town of Ross (Units 4 and 3)

Parks

Recreational facilities in the Town of Ross in the immediate vicinity of Units 4 and 3 are shown in Figure 3.12-2. Frederick Allen Park is located within the project area at the upper end of Unit 3. Frederick Allen Park is a linear park, located just south of the post office, owned and maintained by the Town of Ross. Within the project area, Frederick Allen Park contains trees, a pedestrian pathway, and benches for seating. Tennis courts, managed by the Town of Ross, are located within Frederick Allen Park on the right bank of the creek. Frederick Allen Park is used by bicyclists and walkers traveling along Bike Route 20. Corte Madera Creek is within a concrete channel adjacent to the park and is separated from the park by a fence that generally screens views of the concrete channel from the park.

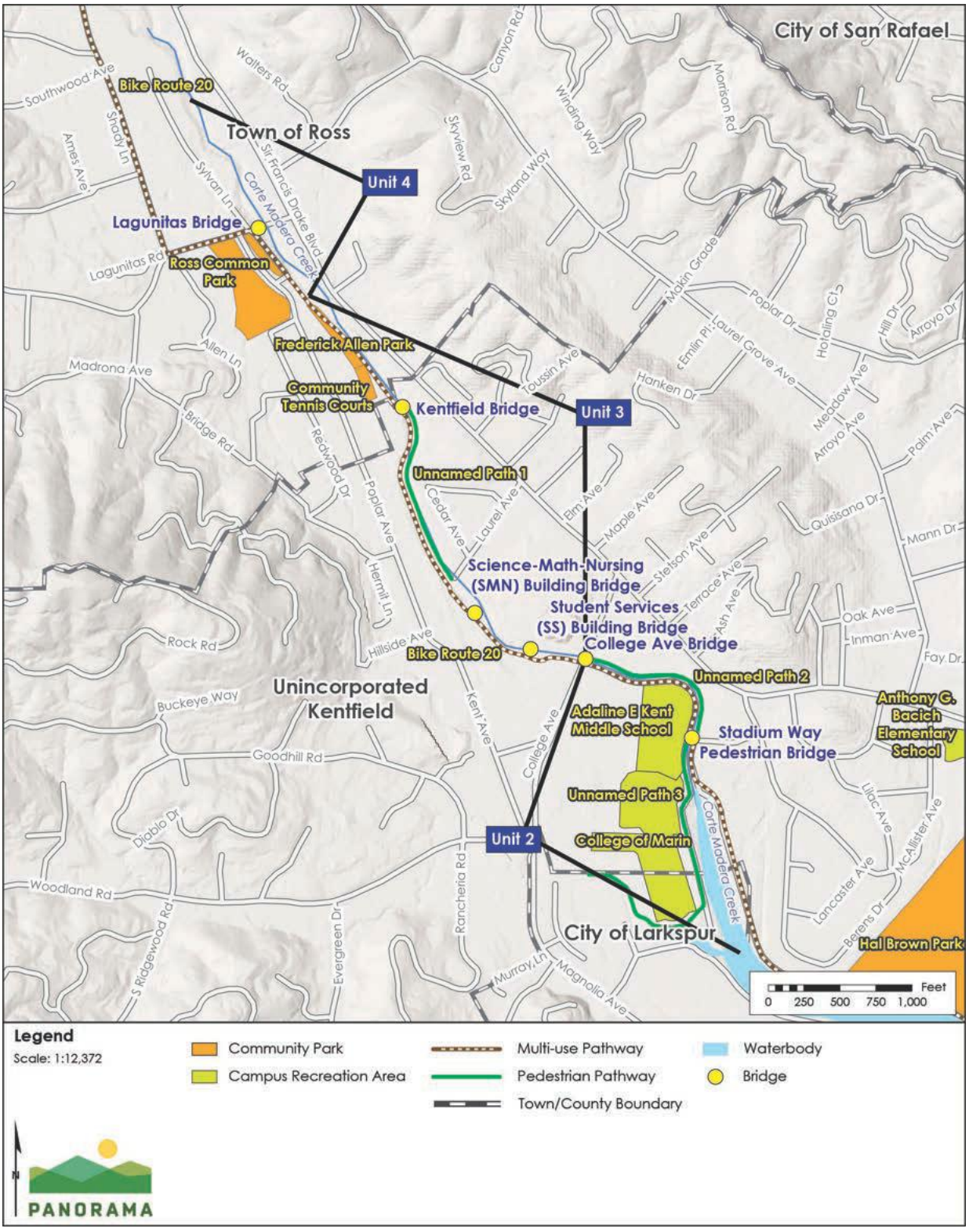
Ross Common Park is a 5-acre park with open space and recreational fields. Ross Common Park is located approximately 150 feet west of Corte Madera Creek. The Town of Ross conducts numerous community events throughout the year within Ross Common Park.

Figure 3.12-1 Recreational Facilities



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, GHD 2020, Prunuske Chatham, Inc. 2020, Local, State and Federal Government Agencies and Special Districts in Marin County California 2017, Local Governments in Marin County, California 2019, US Geological Survey 2013)

Figure 3.12-2 Parks and Recreational Facilities in the Project Area



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, GHD 2020, Prunuske Chatham, Inc. 2020, Golden Gate National Parks Conservancy 2018, Local, State and Federal Government Agencies and Special Districts in Marin County California 2017, Local Governments in Marin County, California 2019)

Table 3.12-2 Parks and Recreational Facilities Located near the Town of Ross and Kentfield Area

Name of Park or Facility	Park Type	Managing Agency
Baltimore Canyon Open Space Preserve	Open space preserve	County Open Space District
Bike Route 20	Multi-use pathway	County Parks
Frederick Allen Park	Community park	Town of Ross
Gerstle Park	Community park	City of San Rafael
Hal Brown Park	Community park	County Parks
Hamilton Park	Community park	City of Larkspur
King Mountain Preserve	Open space preserve	County Open Space District
Marin Municipal Water District open space	Open space preserve	Marin Municipal Water District
Natalie Coffin Greene Park	Community park	Town of Ross
Phoenix Lake and Trails	Open space preserve	Marin Municipal Water District
Ross Common Park	Community park	Town of Ross
Community tennis courts	Tennis courts	Town of Ross

Sources: (Marin County Parks and Open Space Department, 2008; ESA, 2018)

Bicycle and Pedestrian Paths

Bike Route 20 (also known as Corte Madera Creek Pathway) is located adjacent to Frederick Allen Park and the Corte Madera Creek channel within the Town of Ross. Bike Route 20 is a biking and pedestrian pathway that runs from Larkspur Ferry Terminal to the Town of Fairfax (Marin County Bicycle Coalition, 2008). The segment of Bike Route 20 adjacent to Frederick Allen Park in the project area consists of an off-street paved multi-use path. Bike Route 20 transitions from an off-street multi-use path to an on-street bikeway adjacent to Unit 4.

Unincorporated Kentfield (Units 3 and 2)

Parks

Hal Brown Park is located approximately 0.25 mile south of the terminus of Unit 2, directly adjacent to the left bank of Corte Madera Creek. The park is a 27-acre community park and includes walking paths along Corte Madera Creek, picnic tables, a playground, an amphitheater, and large turf fields.

Bicycle and Pedestrian Paths

Bike Route 20 consists of an off-street paved multi-use path adjacent to Units 2 and 3. Bike Route 20 is located on the right bank of Corte Madera Creek from the Town of Ross through Kentfield. Bike Route 20 crosses over Corte Madera Creek to the left bank at the Stadium Way pedestrian bridge and continues along the left bank as an off-street paved multi-use path to Bon

Air Road. Bike Route 20 within Units 2 and 3 is heavily trafficked by pedestrians and bicyclists, including commuters.

Several unofficial pedestrian paths are located adjacent to Corte Madera Creek, opposite Bike Route 20. While the unofficial pedestrian paths are not publicly maintained recreational facilities, they are used by the local community for walking and running and are therefore considered as recreational resources in the area. The unnamed pedestrian paths are shown on Figure 3.12-2. An unnamed pedestrian path is located between Kentfield Hospital and the terminus of Laurel Avenue (unnamed path #1) and also between the southwest intersection of College Avenue and the creek and the Stadium Way Pedestrian Bridge (unnamed path #2). An additional unnamed trail begins on the left bank of the Stadium Way Pedestrian Bridge and continues south where it loops south of the College of Marin football field and veers north to the parking area (unnamed path #3). While these are not official paths, they are utilized by pedestrians.

Public Education Recreational Areas
The Adaline E Kent Middle School and the College of Marin include recreational areas located adjacent to the right bank of Corte Madera Creek in the community of Kentfield. The middle school has a school playground, including basketball courts. The College of Marin has soccer fields, a running track, tennis courts, and volleyball courts.

3.12.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

Federal Regulations

No federal laws or regulations for recreation are applicable to the project.

State Regulations

No state laws or regulations for recreation are applicable to the project.

Regional and Local Regulations

Marin Countywide Plan
The following goals and policies in the Marin Countywide Plan are relevant to the project (Marin County , 2007).

Goal PK-1: A High-Quality Parks and Recreation System. Provide park and recreation facilities and programs to meet the various needs of all county residents.

> ***Policy PK-1.1: Conduct and Coordinate Park Planning.*** Develop park and recreation facilities and programs to provide active recreation, passive enjoyment, and protection of natural resources as a complement to local, state, and national parks and open space in Marin County.

Policy PK-1.2: Consider User Needs, Impacts, and Costs. Plan and develop any needed new park and recreation facilities and programs to meet the desires of the community and protect environmental resources.

Policy PK-1.3: Protect Park Resources from Impacts of Climate Change. Identify strategies to protect park resources from the effects of climate change, such as violent weather, plant loss, or change due to moisture and temperature changes and sea level rise.

Town of Ross General Plan

The following recreational goals, policies, and action in the Town of Ross General Plan are relevant to the project (Town of Ross, 2007).

Goal 1: An Abundance of Green and Healthy Natural Systems

Goal 8: A Beautiful, Safe and Close-Knit Community

Policy 8.4 Downtown and Ross Common. Maintain the Town-owned Ross Common areas linked to uses and activities at Ross School, and linked to the Town's downtown area as the central recreation, gathering and local shopping area of Ross. Maintain the downtown area as an attractive, pedestrian-friendly, small retail/business area. Encourage smaller-scale housing units mixed with commercial uses.

Policy 8.6 Gathering Places. Encourage and enhance community gathering places such as downtown, the Ross Common and the post office. Support the activities of Ross Recreation, Ross School, and the Marin Art & Garden Center.

Action 8.A Prepare a Downtown Area Plan. Develop a plan for the Downtown area as a "Special Planning Area" (see Land Use Plan) to include the Downtown commercial area, parking area through the post office to Lagunitas Avenue, and Ross Common. The plan would include: (1) street design improvements;(2) parking; (3) potential uses, including opportunities for limited housing; (4) design guidelines; (5) pedestrian and bicycle access—including access to Frederick Allen Park and Kentfield Rehabilitation Hospital; and, (6) outdoor gathering areas.

Kentfield/Greenbrae Community Plan

A major goal of the Kentfield/Greenbrae Community Plan is to preserve the physical and cultural characteristics of the major institution uses in the Kentfield/Greenbrae Community Plan, which includes open space parks.

The project is located within Subarea H Public Facilities of the Kentfield/Greenbrae Community Plan. The following conservation development standards in the Kentfield/Greenbrae

Community Plan, Subarea H, are relevant to recreation (Kentfield/Greenbrae Community Planning Group and Marin County Planning Department, 1987):

6. The vacant land east of Stadium Way bordered by McAllister Avenue and the Corte Madera Creek Channel should be considered for use as a community park. The portion of the upland south of the fenced ecology area is a seasonal wetland with large stands of pickleweed. This entire area should be protected in public open space with no destruction of wetlands or the vegetation bordering the creek. Passive community use (benches, etc.) should be confined to the grassy area adjacent to the bike path and people use of the densely vegetated area should be confined to walking the existing paths that meander through the trees. This area borders the left bank of the creek in Unit 2.

3.12.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it would:

a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
b. Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

Given the specific location and design of the project, impacts are analyzed in this section relative to the following additional threshold, which is not listed in Appendix G:

c. Affect existing recreational opportunities.

Approach to Impact Analysis

The following analysis discusses the potentially significant impacts of the project on recreation. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.12.6 Impact Discussion

Impacts Analyzed

	Significance Determination
Impact 3.12-1: The project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Construction

Construction of the project would be short term (less than seven months) and would not induce population growth and associated increase in the use of existing parks or other recreational facilities such that physical deterioration of the facilities would occur or be accelerated. Construction of the project would involve the temporary closure of Frederick Allen Park, the segment of Bike Route 20 adjacent to Frederick Allen Park, and unnamed paths #1, #2, and #3 during construction of project components. These impacts are discussed in detail below.

Unit 4 Fish Ladder Removal and Grading

No recreational facilities are located within the project area of disturbance in Unit 4; therefore, no recreational facilities would be affected by project construction in Unit 4.

Unit 3 Frederick Allen Park

Some temporary impacts would occur to Bike Route 20 during construction as portions of the paths would be used for construction access. The Bike Route 20 segment within Frederick Allen Park would be temporarily closed during project construction, for a period of approximately seven months. Where the pathway is closed within Frederick Allen Park, a detour would be established to divert bicyclists onto Kent/Poplar Avenue from the College of Marin parking lot to Ross Common, as shown on Figure 3.12-2. The tennis courts and pedestrian access to the tennis courts at Frederick Allen Park would remain open throughout the duration of construction. While construction would temporarily remove portions of the pathway available to the public, users could utilize the detoured route. Path usage is expected to remain the same during construction. Temporary closures of the pathway are not expected to shift existing recreational use of the pathway to other nearby recreational facilities. Access along Bike Route 20 through Frederick Allen park would be restored to the realigned pathway once construction of Frederick Allen Park is complete.

The project involves removal of the concrete channel and widening of the channel within Frederick Allen Park. Temporary closure of the park for a period of approximately seven months would make the park unavailable to the public. Under existing conditions, Bike Route 20 through the park is heavily trafficked. While there are benches within the park, many users are pedestrians and bicyclists passing through on Bike Route 20 who do not linger in the park. Temporary closure of the park is not expected to result in higher use of nearby recreational facilities to a level that could cause physical deterioration of those facilities. Bicyclists and pedestrians using Bike Route 20 would be able to use the detoured route instead

of the pathway, and access to the tennis courts south of the park would be maintained. Following construction, Frederick Allen Park would reopen to the public.

Units 3 and 2 Floodwall Segments and Stormwater Pump Station
Temporary impacts would occur along unnamed and unofficial paths #1 and #2 during construction as portions of the path would be closed during construction of the floodwalls and for construction access. Users would be able to use the majority of Bike Route 20 and a detour route during construction closures of the unnamed paths #1 and #2, and access along Corte Madera Creek is expected to be maintained during construction. Temporary closure of unnamed path #1 and #2 would shift the existing recreational use of the path to Bike Route 20 and the associated detour route; however, due to the temporary closure, unofficial nature of the paths, and the lower number of users in comparison to Bike Route 20, any temporary increase in the use of Bike Route 20 would be negligible. The increase in use would not cause substantial physical deterioration of Bike Route 20, and impacts would be less than significant.

Unit 2 Lower College of Marin Concrete Channel Removal
A portion of unnamed and unofficial path #3 located within the construction work area would be closed during the six-week construction period for the concrete channel removal in lower Corte Madera Creek. Users would be able to use Bike Route 20 during construction.

The shift in users from unnamed path #3 to Bike Route 20 would not be substantial given that these paths are unofficial and do not see a high volume of users. The minimal potential increase in use of Bike Route 20 as a result of the six-week construction closure of unofficial path #3 would not cause substantial physical deterioration of Bike Route 20; therefore, the construction impact from Unit 2 concrete channel removal on recreational facilities would be less than significant.

Operation and Maintenance
The proposed project would upgrade existing flood-control infrastructure to reduce the risk of flooding along Corte Madera Creek, which is not a land use that would draw people to the area or increase the use and associated physical deterioration of recreational facilities. The proposed project would not create any permanent employment and is not expected to induce population growth that would in turn increase the use of the existing parks or other recreational facilities such that physical deterioration of the facilities would occur or be accelerated. Impacts from increased use of existing facilities would be less than significant. The analysis below is focused on the changes to the existing recreational facilities that would occur as a result of the project and the potential for those modifications to cause physical deterioration of recreational amenities.

Unit 4 Fish Ladder Removal and Grading
No recreational facilities are located within Unit 4; therefore, no recreational facilities would be affected by project operation in Unit 4.

Unit 3 Frederick Allen Park

Project elements within Frederick Allen Park include the removal of the existing concrete channel and construction of a new, wider earthen channel and floodplain, habitat enhancement through planting of riparian vegetation, and access steps from the pathway to the creek bank for passive recreation. The changes to the park are not expected to substantially increase use of the park because Bike Route 20, the focal point of the park, is an existing pathway. Access via Bike Route 20 would be restored, and usage is expected to be similar to existing conditions. The use of Frederick Allen Park would change following construction to allow recreationists to have increased viewing and access to the creek. The environmental impact of the new access to the creek is discussed under Impact 3.12-2 below. The realigned Bike Route 20 multi-use path through Frederick Allen Park would abut the top of the channel and floodplain. A new split-rail fence would be installed at the top of the bank, and signage would be placed along the pathway to educate the public about the project and stream as well as habitat improvements and reduce encroachment into the new riparian habitat areas along the creek. The fencing and educational signage would reduce travel into areas that would cause physical deterioration of the park; therefore, the impact from physical deterioration would be less than significant.

Units 3 and 2 Floodwalls and Stormwater Pump Station

As described in the Project Description, the floodwall would be built on top of the existing concrete channel wall or set back from the existing wall. If the floodwall is set back from the existing wall, it would be sited on the east side of unnamed and unofficial paths #1 and #2 and would not affect access along the path. Access along both paths would be maintained during project operation, and the number of users of the paths would be similar to existing conditions. Substantial physical deterioration to unnamed paths #1 and #2 would not occur.

Unit 2 Lower College of Marin Concrete Channel Removal

Access along unnamed path #3 would be restored once the concrete channel removal construction is complete. A new informal path segment would be constructed on the right side of the creek to replace the segment of unnamed path #3 affected by the concrete-channel-removal construction. The new path segment would connect to the existing unnamed path #3 located south of the concrete-channel-removal work area, restoring access along unnamed path #3. Access would be maintained during project operations, and the number of path users would be similar to existing conditions. Substantial physical deterioration to unnamed path #3 would not occur.

Mitigation: None required.

	Significance Determination
Impact 3.12-2: The project would include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Overview

The fish-ladder removal and grading in Unit 4, new floodwall segments, and stormwater pump station in Unit 3 would not include recreational facilities or require the construction or expansion of recreational facilities that would have an adverse effect on the environment, and there would be no impact from construction or operation and maintenance of these facilities. The Frederick Allen Park and lower College of Marin concrete-removal project components include modifications to existing recreational facilities and recreational access. The impact of these recreational facilities is discussed below.

Construction

Construction of the project is not expected to induce substantial population growth that would in turn generate new recreational demand, requiring the construction or expansion of recreational facilities.

Unit 3 Frederick Allen Park

The project would include construction of new and relocated recreation elements within Frederick Allen Park, including new access to the creek and relocation and realignment of Bike Route 20. These changes to recreational elements within Frederick Allen Park could have adverse physical effects on the environment. These features are a part of the overall project, and impacts associated with implementing these features are analyzed throughout this document. The impacts that would result during construction of the realigned Bike Route 20 and the new creek access include tree removal and potential erosion from the grading and earth disturbance. Implementation of the planting plan included in Appendix B and compliance with the Construction General Permit through preparation of a project-specific Stormwater Pollution Prevention Plan would reduce impacts from the realigned pathway and new recreational elements in the park. Impacts from construction of recreational features at Frederick Allen Park would be less than significant.

Lower College of Marin Concrete Channel Removal

The project would include construction of an informal recreational path segment on the right side of the creek within a disturbed area on the College of Marin property to replace the segment of unnamed path #3 affected by the concrete-channel-removal construction. The new path segment would connect to the existing unnamed path #3 located south of the concrete-channel-removal work area. The new informal path segment would be located in a disturbed area, and the construction of the new path would not have significant impacts on the environment. The impact would be less than significant.

Operation and Maintenance

As discussed above, the project is not expected to induce substantial population growth that would in turn generate new recreational demand, requiring the construction or expansion of recreational facilities.

Unit 3 Frederick Allen Park

The project would involve improvements to Frederick Allen Park, including a new pedestrian pathway and adjacent tree planting for shade, relocation of the existing Bike Route 20 along the western edge of the park, and resting areas with seating and signage. These improvements are not expected to substantially change the use of the park from existing conditions, as recreationalists would continue to use the pathway and benches within the park similar to existing conditions.

Improvements also include installation of rocks, a split-rail fence to prevent encroachment into riparian habitats during the plant establishment period, and an opening in the split-rail fence that would allow for pedestrians to access the natural creek channel via an informal path. This improvement constitutes a new recreational feature as access to the bank of the creek does not currently exist. Allowing access to the creek bank could result in potential impacts to vegetation along the creek bed and to the water quality of the creek. The project would include installation of educational signage to support public education about streamflow processes and riparian corridors. Signs would also be installed to ask people to "keep out of restoration areas" during the plant establishment period. Due to the installation of fencing and educational signage, the impacts of the new informal path providing recreational access to Corte Madera Creek would be less than significant.

Unit 2 Lower College of Marin Concrete Channel Removal

The project would include construction of an informal recreational path segment on the right side of the creek within a disturbed area on the College of Marin property in Unit 2. Use of the new path is not expected to result in adverse physical effect on the environment because it would be replacing a segment of the existing unnamed path #3 that would be removed by the concrete channel removal project element. The new path would connect to an unaffected segment of unnamed path #3 located downstream of the concrete channel removal work area. The new path would be located outside of the restored channel and would have beneficial effects on the environment by reducing the risk that recreationists create their own footpaths within the newly restored habitats, which could cause erosion. The new informal footpath would not have an adverse physical effect on the environment, and impacts would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.12-3: The project could affect existing recreational opportunities.	**Construction: Less than Significant with Mitigation** **Operation and Maintenance: Less than Significant with Mitigation**

Construction

Construction of the project would involve the temporary closure of Frederick Allen Park, the segment of Bike Route 20 adjacent to Frederick Allen Park, and unnamed paths #1, #2, and #3 during construction of project components. Temporary closure of these recreational facilities during construction are discussed in Impact 3.12-1.

Frederick Allen Park

Access to the tennis courts at Frederick Allen Park would be maintained throughout the construction period. The recreational experience at the tennis courts would be affected by noise and dust during construction; however, the tennis courts would remain open for recreational use and the impact on the recreational opportunity would be less than significant.

Closure of Frederick Allen Park north of tennis courts and the segment of Bike Route 20 adjacent to Frederick Allen Park would be a temporary loss of recreational opportunity for up to seven months. The temporary impact on recreational opportunity due to closure of a segment of Bike Route 20 would be significant because Bike Route 20 is a significantly used recreational resource for the community. **Mitigation Measure 3.13-1: Traffic Management** requires use of flaggers to safely detour and redirect bicycle and pedestrian traffic around the construction area to safely connect access to Bike Route 20 around the work area. Mitigation Measure 3.13-1 also requires advance notification about the construction activities and impact on the Bike Route 20 multi-use pathway. Because the mitigation measure would provide safe detours for recreationists which would allow recreationists to continue to use Bike Route 20, and there are sufficient park spaces available for recreational use during the construction period, the impact on recreational opportunities during construction would be less than significant with mitigation.

Unnamed Paths

The project would require temporary closure of unnamed paths #1, #2, and #3 during construction of floodwalls. The closures would last a few weeks. As described in Impact 3.12-1, access would be restored once construction is complete. Due to the limited and unofficial use of the unnamed paths and the ability to redirect recreational use to the official pathway at Bike Route 20, the impacts to recreational opportunity from temporary closure of unnamed paths #1, #2, and #3 during construction would be less than significant.

Operation and Maintenance

The analysis below focuses on the changes to the existing recreational facilities that would occur as a result of the project and the potential for those modifications to affect existing recreational opportunities.

Unit 4 Fish Ladder Removal and Grading

No recreational facilities are located within Unit 4; therefore, no recreational opportunities would be affected by project operation in Unit 4.

Unit 3 Frederick Allen Park

The project would involve changes to Frederick Allen Park, including removal of the existing concrete channel and construction of a new, wider earthen channel and floodplain, realignment of Bike Route 20, planting of riparian vegetation, and addition of rocks from Bike Route 20 down to the creek bank for passive recreation. The proposed rocks creating new access to the creek bank would create a new recreational opportunity by providing access to the creek, which does not currently exist. The new access to the creek and educational opportunities afforded through increased creek and habitat viewing would have a beneficial impact on the recreational experience in Frederick Allen Park.

Following construction, Bike Route 20 would be realigned along the edge of the park and at the top of the newly constructed creek channel. The multi-use pathway would drop gradually in elevation from the tennis courts to the widest area of the channel meander and rise gently back to the area adjacent to the connection with Unit 4. The realigned pathway would be designed to meet Americans with Disabilities Act requirements and the minor change in grade (less than 5 percent) along the pathway would not affect public access most of the year. The change in elevation of the pathway and removal of the concrete floodwall on the creek side of the pathway would result in increased flooding of the pathway as discussed in Section 3.9 Hydrology and Water Quality. The increased flooding would affect commuter and recreationist access to the pathway during flooding when the park is closed to protect public safety. The closure of the park due to flooding would not be routine and would only occur during major storm events when people are much less likely to be bicycle riding or recreating due to extreme weather conditions. Bicyclists and pedestrians would also have access to sidewalks and bike lanes on adjacent streets and other recreational areas outside the floodplain during the short periods when Frederick Allen Park is closed due to flooding. Because of the very infrequent and short duration of temporary park closures due to flooding and because recreationists are less likely to use outdoor recreational areas during extreme weather events, the impact from increased flooding in Frederick Allen Park would be less than significant.

The project construction would involve removal of trees within Frederick Allen Park, and the project includes planting of riparian vegetation within the park to account for this tree removal and for habitat enhancement. However, there would be a loss of vegetation cover and shade in the years immediately following construction and before the tree canopy is fully established. The tree canopy and associated shade on Bike Route 20 would be reduced for approximately 10 years following construction. The planting plan includes planting of larger trees to provide some immediate shade for those seated at the benches and walking along the pathway, especially during the summer; however, there would still be a reduction in shade during the first 10 years following construction compared to existing conditions. The reduced shade would affect the recreational experience of the park until the tree canopy has re-established and the park would be shaded similar to existing conditions. The impact on the recreational experience

would be most severe for elderly recreationists that use Frederick Allen Park due to protection from the sun and proximity to elderly care centers. The impact on the recreational opportunity from the reduction in shade during the first 10 years after revegetation would be significant. The District would implement **Mitigation Measure 3.1-3: Large Tree Planting** and **Mitigation Measure 3.12-3: Temporary Shade Structures** to reduce the effect from reduction in shade while trees establish post-construction. Mitigation Measure 3.1-3 includes planting with larger box trees to provide more shade following landscaping. Mitigation Measure 3.12-3 includes installation of temporary shade structures along the pathway to provide additional temporary shade during the plant establishment period. The shade structures would be designed and placed in coordination with the Town of Ross to locate shade at locations that best suit the community and select shade structures that fit within the landscape visual context of Frederick Allen Park. Due to planting of larger trees and installation of temporary shade structures, the impact on the recreational opportunity from temporary reduction in shade would be less than significant with mitigation.

Units 3 and 2 Floodwalls and Stormwater Pump Station

As described in Impact 3.12-1, unnamed paths #1 and #2 would be unaffected by operation of the floodwalls and stormwater pump station in Units 3 and 2; therefore, no recreational opportunities would be affected, and there would be no impact.

Unit 2 Lower College of Marin Concrete Channel Removal

As described in Impact 3.12-1, a new recreational path would be constructed to replace a segment of the existing unnamed path #3 that would be removed during the concrete-channel removal. Access along the realigned unnamed path #3 would be maintained, and the recreational opportunity would remain during project operation; therefore, the impact would be less than significant.

> **Mitigation:** Implement Mitigation Measure 3.1-3: Large Tree Planting; Mitigation Measure 3.12-3: Temporary Shade Structures; and Mitigation Measure 3.13-1: Traffic Management.
>
> **Mitigation Measure 3.12-3: Temporary Shade Structures.** The District shall coordinate with the Town of Ross to select the type and location for installation of temporary shade structures in Frederick Allen Park. The temporary shade structures shall be located along the edge of the Bike Route 20 multi-use path and at seating areas as needed to provide shade during the vegetation establishment period. The temporary shade structures shall be removed when the tree canopy has sufficiently established to provide afternoon shade of the pathway and as determined through coordination with the Town of Ross. The District will submit a draft plan for the shade structures to the Town of Ross no less than 60 days prior to construction.
>
> **Significance after Mitigation:** Traffic management mitigation would reduce the impact on recreational opportunities during construction to a less-than-significant level because recreational access on Bike Route 20 would be rerouted using detours. Mitigation measures for larger tree planting and shade structures would reduce the impact from

temporary loss of shade to a less-than-significant level because the larger trees and shade structures would replace the recreational opportunity for individuals seeking shaded recreation.

3.12.7 References

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3.13 Transportation and Circulation

3.13.1 Introduction

This section addresses environmental conditions relevant to roadways, transportation resources, and traffic circulation in areas that could be potentially affected by the project in and near the Town of Ross and in unincorporated Marin County and examines whether the project could have a significant impact on transportation and circulation. This section provides an overview of the existing conditions and the regulatory setting that apply to transportation and circulation within the project area. It then presents and discusses the potential project impacts and appropriate mitigation measures, as necessary.

3.13.2 Scoping Comments

Comments related to transportation, traffic, and circulation impacts were received during the public scoping process. These comments and the location where they are addressed in the transportation and circulation analysis are provided in Table 3.13-1.

Table 3.13-1 Transportation and Circulation Scoping Comments

Agency/Entity	Comment	Location in Transportation Section that Comment is Addressed
Garril Page	A realigned multi-use pathway encourages speeding bikes that endanger pedestrians, small children and pets enjoying walks along the path.	Section 3.13.6, Impact 3.13-2
Garril Page	Biking has become more and more popular form of recreation and for some people, of transportation. Unfortunately, the increase in popularity has meant increases in heedless behavior, traffic violations and increased speed that endangers pedestrians. Upgrading the multi-use path encourages greater use and abuse, requires more regulation, increased supervision, and added demands on Town staff and services as well as less privacy for town residents. The lengthy period of construction for the FAP Riparian corridor increases traffic disruption and inconvenience for Ross residents and drivers on SFD. The proposed FAP Riparian Corridor is maximum disruption for minimal gain.	Section 3.13.6, Impact 3.13-3

3.13.3 Environmental Setting

Overview

The project area is served by a roadway network of freeways (e.g., U.S. Highway 101 [Highway 101] and Interstate 580 [I-580]), arterial roadways (e.g., Sir Francis Drake Boulevard), and local streets.

Regional Access

Primary regional access to the project area is via Highway 101 and I-580. Highway 101 is highly congested, particularly during commute hours, because it is the primary link connecting the north Bay Area to the City of San Francisco. The highway also intersects with other important highways, such as I-580, which provides important inter-county and inter-regional links to the East Bay and Sacramento. Highway 101 is also vital in connecting communities within the county for everyday activities such as shopping, school, and recreation. Highway 101 has an annual average daily traffic volume of 147,000 (northbound) and 167,000 (southbound) vehicles at the interchange of Sir Francis Drake Boulevard southeast of the project area (Caltrans, 2016).

Northbound and southbound traffic on Highway 101 exits onto westbound Sir Francis Drake Boulevard, a major Marin County thoroughfare that extends from I-580 just west of the Richmond–San Rafael Bridge to the Point Reyes Lighthouse. Sir Francis Drake Boulevard is the primary east–west corridor in Marin County and is included as an arterial in the Marin County Congestion Management Program (CMP) from Toussin Avenue to College Avenue (lower Unit 3) and from College Avenue to Wolfe Grade (Unit 2) (TAM, 2019). Sir Francis Drake Boulevard is primarily a four-lane rural highway, which widens to six lanes approaching Larkspur Landing east of Highway 101 and narrows to two lanes as it extends west beyond Fairfax. Sir Francis Drake Boulevard in areas parallel to Unit 2 and extending up to College Avenue consists of two travel lanes in each direction, with a left turn lane at intersections. Sir Francis Drake Boulevard in areas parallel to Unit 3 and 4 north of College Avenue consists of one travel lane in each direction, with a center turn lane. The daily traffic volume on Sir Francis Drake Boulevard varies, ranging from 22,500 vehicles on the two-lane section between Town of Ross and Elm Avenue, to 31,500 vehicles on the four-lane section between Elm Avenue and McAllister Avenue (LSA, 2018).

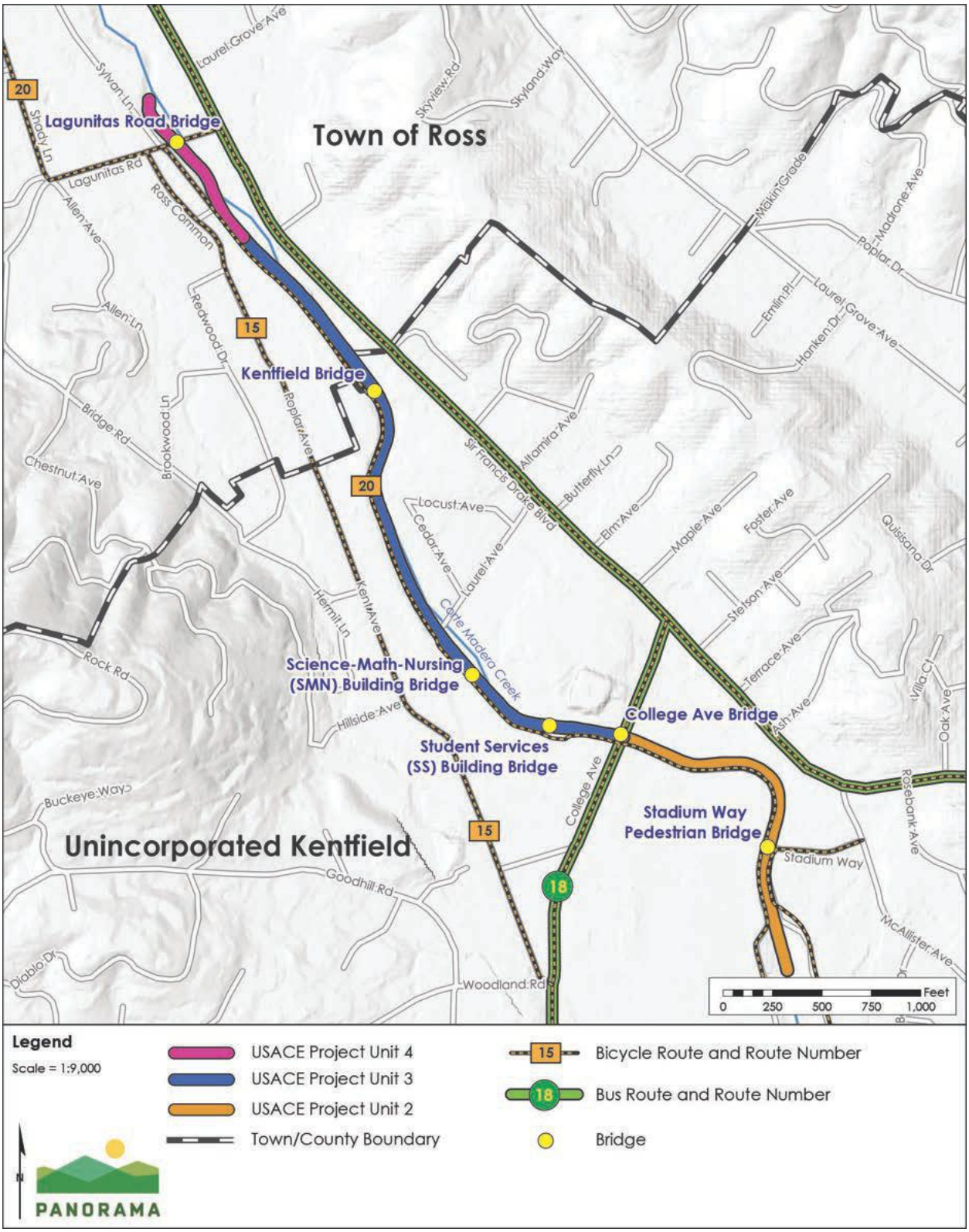
Local Transportation Network

The local transportation network in the project vicinity is shown on Figure 3.13-1. The local transportation network includes roads used for vehicle access, public transit, bikeways, and pedestrian access.

Vehicle Access

Sir Francis Drake Boulevard provides the main access to the project area from Highway 101 (Figure 2.6-5). Sir Francis Drake Boulevard is a main emergency or evacuation route for communities in West Marin (Marin County , 2019). Unit 4 and upper Unit 3 of Corte Madera Creek are accessible from Sir Francis Drake Boulevard, Lagunitas Road, and Ross Commons. Lagunitas Road extends from the Marin Art and Garden Center at Sir Francis Drake Boulevard through central Ross, past Ross School, residences, and the Lagunitas Country Club and terminates at Natalie Coffin Greene Park. Lagunitas Road crosses Corte Madera Creek at the Lagunitas Road Bridge in Unit 4. The Lagunitas Road Bridge was replaced in 2010.

Figure 3.13-1 Local Transportation Network



Sources: (Marin Transit , 2020; Golden Gate Bridge Highway and Transportation District, 2020)

The right bank of lower Unit 3 can be accessed from Poplar Avenue/Kent Avenue. Poplar Avenue/Kent Avenue is a local two-lane roadway that is parallel to Corte Madera Creek from College Avenue to Lagunitas Road. The left bank of Unit 3 can be accessed from Laurel Avenue and Cedar Avenue. Laurel Avenue and Cedar Avenue are two-lane local roads that provide local residential and College of Marin access from Sir Francis Drake Boulevard.

College Avenue crosses Corte Madera Creek at the College Avenue Bridge. College Avenue extends from Sir Francis Drake Boulevard and provides access to Kent Middle School and College of Marin properties on the right bank of Unit 2. The left bank of Unit 2 can be accessed from Stadium Way.

Transit Service

Golden Gate Transit and Marin County Transit District (Marin Transit) provide public transit service within the project area. Golden Gate Transit is a public transportation system serving the North Bay region and provides bus service along Sir Francis Drake Boulevard and College Avenue in the project area via Routes 18, 24, 24c, 24x, and 25 (Golden Gate Bridge Highway and Transportation District, 2020). Marin Transit provides local transit service within Marin County. Routes 22 and 228 are Marin County Transit routes along Sir Francis Drake Boulevard in the project area (Marin Transit , 2020). Bus stops in the project vicinity include bus stops along Sir Francis Drake Boulevard and College Avenue that also serve the College of Marin and Kent Middle School near the project area.

Bikeways/Pedestrian Circulation

Bikeways

Two countywide bike routes (Bike Route 15 and Bike Route 20) are located within and near the project area on the right bank of the Corte Madera Creek. Bike Route 15 is an on-street bikeway (shared roadway with motor vehicles) that runs along Ross Common, Poplar Avenue, and Kent Avenue from Lagunitas Road to Woodland Road.

Bike Route 20 follows the right bank of Corte Madera Creek and runs from Larkspur Ferry Terminal to the Town of Fairfax (Marin County Bicycle Coalition, 2008). Bike Route 20 is a biking and pedestrian pathway. The segment of Bike Route 20 within the project area consists of an off-street paved multi-use pathway adjacent to Corte Madera Creek Units 2 and 3. Bike Route 20 transitions to an on-road bike path adjacent to Unit 4. Bike Route 20 crosses over Corte Madera Creek from the right bank to the left bank at the Stadium Way pedestrian bridge and continues along the left bank as an off-street paved multi-use path to Bon Air Road. Bike Route 20, within Units 3 and 2, is heavily trafficked by pedestrians and bicyclists, including commuters.

Pedestrian Circulation

Sidewalks are located on Ross Common, Poplar Avenue, Kent Avenue, and College Avenue throughout the project area. Pedestrian access is also available on the Bike Route 20 multi-use pathway on the right bank of Units 3 and 2.

Two pedestrian bridges cross Corte Madera Creek in the College of Marin campus upstream of the College Avenue Bridge. These bridges include the pedestrian/maintenance access bridge connecting the West Campus parking area to the Student Services Building (SS Bridge) and the pedestrian bridge that connects the same parking area to the Science-Math-Nursing Building (SMN Bridge). The SS Bridge is located approximately 350 feet upstream from College Avenue, and the SMN Bridge is located approximately 500 feet upstream from the SS Bridge. A third pedestrian bridge crosses the creek at the end of Stadium Way in lower Unit 2.

Several unofficial pedestrian paths are located adjacent to Corte Madera Creek, opposite Bike Route 20. An unnamed pedestrian path is located between Kentfield Hospital and the terminus of Laurel Avenue (unnamed path #1) and between the southwest intersection of College Avenue and the creek and the Stadium Way Pedestrian Bridge (unnamed path #2). An additional unnamed trail begins on the left bank of the Stadium Way Pedestrian Bridge and continues south, where it loops south of the College of Marin football field and veers north to the parking area (unnamed path #3). While these are not official paths, they are utilized by pedestrians. Refer to Section 3.12 Recreation for more information on these unofficial pedestrian paths.

3.13.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

Federal Regulations

No federal laws or regulations for recreation are applicable to the project.

State Regulations

California Department of Transportation

California Department of Transportation (Caltrans) has jurisdiction over state highways and sets maximum load limits for trucks and safety requirements for oversized vehicles that operate on highways. Caltrans developed a "Guide for the Preparation of Traffic Impact Studies" (Caltrans, 2002) to provide guidance in determining if and when a traffic impact study is needed and requirements for producing a study. Caltrans prepares Transportation Concept Reports for each of its facilities. A Transportation Concept Report is a long-term planning document that each Caltrans district prepares for every state highway for long-range corridor planning processes.

Senate Bill 743

Senate Bill (SB) 743, passed in 2013, requires Office of Planning and Research (OPR) to develop new CEQA guidelines that address traffic metrics under CEQA. As stated in the legislation, upon adoption of the new guidelines, "automobile delay, as described solely by LOS or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment pursuant to this division, except in locations specifically identified in the guidelines, if any." The December 28, 2018, update to CEQA Guidelines included Section 15064.3 to determine the significance of transportation impacts. Section 15064.3 does not include specific metrics for evaluating construction impacts but states, "For many projects, a

qualitative analysis of construction traffic may be appropriate." It is the responsibility of the lead agency to determine the most appropriate metric to disclose transportation impacts.

Regional and Local Regulations

The project would only generate construction-related vehicle traffic. The goals and policies presented below are relevant to the analysis of construction-related traffic.

Marin Countywide Plan

The following traffic-related goals and policies presented in the Marin Countywide Plan are applicable to the project (Marin County Community Development Agency, 2015):

Goal TR-1: Safe and Efficient Movement of People and Goods. Provide a range of transportation options that meet the needs of residents, businesses, and travelers.

Town of Ross Municipal Code

The following codes of the Town of Ross Municipal Code related to transportation are applicable to the project (Town of Ross, 2020).

Chapter 12.04 Excavations

> **12.04.010 Permit Required.** It is unlawful for any person to cut, open, excavate or tear up any portion of any street, lane, avenue, public thoroughfare, or other public property within the town, for the purpose of laying, replacing or repairing any pipe, conduit or sewer therein, or for any other purpose whatsoever, without first obtaining a permit therefor and making a deposit with the superintendent of streets (Prior code §7100).
>
> **12.04.020 Notification to superintendent of streets.** Any person desiring to cut, open, excavate or tear up any portion of any street, lane, avenue, public thoroughfare or other public property within the town, for the purpose of laying, replacing or repairing any pipe, conduit or sewer therein, or for any other purpose whatsoever, shall, before proceeding with the work, notify the superintendent of streets of the character and extent of the work proposed to be done and obtain from the superintendent of streets a permit to proceed with the work as the same shall be described in the permit (Prior code §7101).

Chapter 12.08 Encroachments in the Public Right-of-Way or Other Public Property

> **12.08.030 Permit Required.** No person shall create or maintain an encroachment, without obtaining and keeping in force and effect a permit as required by this chapter (Ord. 638 (part), 2013; Prior codes §3400, §3401, §3402, §3403).
>
> **12.08.040 Exceptions.** The following shall be exempt from the provisions of section 12.08.030 of this chapter:
>
> > b. Town officers, employees, or independent contractors serving the role of Town officials, or agents acting in the discharge of their official duties.
> >
> > c. Any work being performed by any person pursuant to a contract with the Town.

Town of Ross General Plan

The following policies of the Ross General Plan related to transportation are applicable to the project (Town of Ross, 2007).

Goal 7. Safe, Connected and Well-Maintained Streets, Pedestrian and Bicycle Routes

> **7.5 Pavement Management.** Maintain acceptable pavement management on all public streets and mitigate roadway impacts due to construction activities for aesthetic, structural and acoustical reasons. Hold developers responsible for pavement degradation caused by construction vehicles.
>
> **7.8 Bicycle and Pedestrian Travel.** Encourage travel via bicycle and walking by providing and maintaining safe pedestrian and bicycle routes along main arteries in Ross. Consider links with Town destinations, surrounding area destinations and regional trails and bicycle systems. Participate in the Safe Routes to Schools Program.

Kentfield/Greenbrae Community Plan

The following goal of the Kentfield/Greenbrae Community Plan related to transportation is applicable to the project (Kentfield/Greenbrae Community Planning Group and Marin County Planning Department, 1987).

> **IV. Circulation Policy 1.** The Kentfield/Greenbrae community desires a circulation system which allows safe movement and ready mobility for non-motorized traffic and for motor vehicles while preserving the community character.

3.13.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project could have a significant impact if it 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. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or
d. Result in inadequate emergency access.

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to transportation and circulation. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed

based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.13.6 Impact Discussion

Impacts Analyzed

	Significance Determination
Impact 3.13-1: The project could conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: Less than Significant

Construction

Vehicle Trips and Access Routes

Project construction would generate additional vehicle travel on area roadways from construction-worker vehicles and truck trips associated with delivery of equipment and materials and removal of excavated material and waste. Construction is assumed to begin in April 2022 with several overlapping phases. Construction of the project is anticipated to take approximately seven months (152 total workdays) at Frederick Allen Park and less time in other areas. Truck-trip estimates are provided in Table 2.6-5 in Chapter 2 Project Description. Several construction phases have overlapping construction time periods that could result in higher peak daily truck trips. Construction would generate a maximum of 509 one-way vehicle trips (417 trucks trips and 92 worker vehicle trips) per day during an up to two-week period. This would be expected to only occur for a short period during peak import and export of material for construction. The maximum average vehicle trips that would more typically occur during this two-week period would be far lower; 94 total one-way trips (42 truck trips and 52 worker trips). Project-related vehicle traffic would be even lower during the remainder of construction.

Vehicles would travel on Sir Francis Drake Boulevard to access all work areas. Vehicles traveling to Unit 4 and Frederick Allen Park would travel on Lagunitas Road and Ross Common. Vehicles traveling to Unit 3 floodwalls, fish-pool construction, and stormwater pump station would travel on Locust Avenue, Cedar Avenue, and Laurel Avenue. Vehicles traveling to the Unit 2 floodwall would travel on College Avenue and Stadium Way. Vehicles traveling the lower College of Marin concrete-channel-removal area would travel on Woodland Road. Limited vehicle access would also occur on segments of Bike Route 20 within Unit 3 and on an informal path within the District's easement on the left bank. During peak construction, vehicles would be dispersed through the local road network because access to each work area would be provided from different access roads, with the exception of Lagunitas Road and Ross Commons, which provide access to Frederick Allen Park and Unit 4, and Laurel Avenue, which provides access to the stormwater pump station and a segment of new floodwall.

Road, Bicycle, and Pedestrian Route Closures

Lane closures would occur on College Avenue for up to two days during dewatering. The end of Laurel Avenue could be closed for up to one month during stormwater pump station

construction. The segment of Bike Route 20 adjacent to Frederick Allen Park would be closed to pedestrian and bicycle access for up to seven months.

Operation and Maintenance

Following construction, Bike Route 20 would be re-opened, and the bike route would be located along the western limits of the park. The bike route would have the same capacity as existing conditions. The project would not require regular worker trips for operation. The frequency of inspection and maintenance of the Corte Madera Creek channel and floodwalls would be the same as under existing conditions. The stormwater pump station would require annual testing of the generator.

Plan, Program, and Policy Consistency Analysis

The project is located in the Town of Ross and Kentfield in unincorporated Marin County. Access to the project would be provided on Sir Francis Drake Boulevard, which is subject to the Marin Congestion Management Program. Bike and pedestrian routes occur in the project area and vicinity. Programs, plans, policies, and ordinances that are applicable to the circulations system in the project area include the following:

- Town of Ross General Plan
- Kentfield/Greenbrae Community Plan
- Marin Countywide Plan
- Marin Congestion Management Program
- Marin County Unincorporated Area Bicycle and Pedestrian Facility Master Plan (Alta Planning + Design, 2018)

Table 3.13-2 lists the programs, plans, and policies relevant to the circulation system in the project area and provides an evaluation of whether the project construction operation and maintenance would conflict each requirement.

Table 3.13-2 Applicable Transportation Programs, Plans, and Policies

Local Transportation Program or Plan	Policy	Analysis
Town of Ross General Plan	**7.5 Pavement Management.** Maintain acceptable pavement management on all public streets and mitigate roadway impacts due to construction activities for aesthetic, structural, and acoustical reasons. Hold developers responsible for pavement degradation caused by construction vehicles.	The project would not involve the use of heavy-duty tracked construction equipment that would damage pavement on local roadways surrounding the project area. The short-term project construction traffic would be dispersed on local roadways, and the short-term additional truck trips on local roads would not cause pavement degradation. The project would not conflict with this policy.
	7.8 Bicycle and Pedestrian Travel. Encourage travel via bicycle and walking by providing and maintaining safe pedestrian and	**Construction.** The project would result in closure of Bike Route 20 within Frederick Allen Park for up to seven months. The temporary closure of the bike route could

Local Transportation Program or Plan	Policy	Analysis
	bicycle routes along main arteries in Ross. Consider links with Town destinations, surrounding area destinations, and regional trails and bicycle systems. Participate in the Safe Routes to Schools Program.	result in temporarily unsafe travel conditions for bicyclists and pedestrians if bicyclists and pedestrians were not safely routed to bike and pedestrian safe routes during closure of Bike Route 20. The potential for unsafe conditions during construction is a potential conflict with the policy. Mitigation Measure 3.13-1 requires traffic management and rerouting bicycle and pedestrian traffic safely onto streets that support bicycle and pedestrian uses. The conflict with the policy would be less than significant with mitigation. **Operation.** The project would realign Bike Route 20 within Frederick Allen Park. The realigned multi-use pathway would maintain the safe pedestrian and bicycle route within Ross. The project would not conflict with this policy.
Kentfield/Greenbrae Community Plan	**IV. Circulation Policy 1.** The Kentfield/Greenbrae community desires a circulation system which allows safe movement and ready mobility for non-motorized traffic and for motor vehicles while preserving the community character.	The project would realign Bike Route 20 and allow for continued use of the multi-path trail for bicyclists and pedestrians post-construction. As described in Impact 3.14-3, the realigned pathway would be regraded with a one- to two-percent change in slope from existing grade. This minor change in grade from the existing condition would not change lines of sight or increase bicycle speeds to an extent where it would create a hazard to pedestrians. The project does not include any new design features or alterations for existing local roadways that would affect motor vehicle circulation. The project would not conflict with this policy.
Town of Ross Municipal Code	**12.04.010 Permit Required.** It is unlawful for any person to cut, open, excavate or tear up any portion of any street, lane, avenue, public thoroughfare, or other public property within the town for the purpose of laying, replacing, or repairing any pipe, conduit, or sewer therein, or for any other purpose whatsoever, without first obtaining a permit therefor and making a deposit with the	The project would not open, excavate, or tear up any streets for the purpose of laying, replacing, or repairing any pipelines. There would be no conflict.

Local Transportation Program or Plan	Policy	Analysis
	superintendent of streets (Prior code §7100).	
	12.08.030 Permit Required. No person shall create or maintain an encroachment, without obtaining and keeping in force and effect a permit as required by this chapter (Ord. 638 (part), 2013; Prior codes §3400, §3401, §3402, §3403).	The project would obtain a permit for construction within Town property at Frederick Allen Park, as needed. There would be no conflict with this policy.
Marin Congestion Management Program	If a general plan update or amendment, or major development proposal, is projected to generate a net increase of 100 vehicle trips during the PM (afternoon) peak hour, information is to be forwarded to TAM for comment and is subject to a CMP analysis. Local jurisdictions are responsible for determining which projects meet these criteria. The PM peak hour is most appropriate for this determination given that, for most roadway segments, traffic levels of service are worse during the PM peak hour than during the AM peak hours. Examples of projects that typically meet the 100-trip threshold include 100 single-family homes, 150 apartment units, 5,000 square feet of retail space, or 40,000 square feet of office space.	The project is not a development proposal that would generate new permanent peak-hour trips. Construction of the flood-control project would generate a maximum of 56 peak-hour worker trips traveling on Sir Francis Drake Boulevard during the peak of construction for up to two weeks. The project would generate 94 average daily trips during the construction period. Truck deliveries would be distributed throughout the nine-hour work day and would not generate trucks trips that would exceed the 100-trip threshold. The truck trips would also be temporary and limited to the short duration of construction. The proposed flood control project would not generate new peak-hour trips during operation. Because the project would not generate permanent traffic and the number of peak-hour trips would not exceed 100, there would be no conflict with the CMP.
Marin County Unincorporated Area Bicycle and Pedestrian Facility Master Plan	**Goal 2 Bicycle Transportation.** Make the bicycle an integral part of daily life in Marin County, particularly for trips of less than five miles, by implementing and maintaining a bikeway network, providing end-of-trip facilities, improving bicycle/transit integration, encouraging bicycle use, and making bicycling safer and more convenient for people of all ages and abilities.	The project will include realignment of Bike Route 20 in Frederick Allen Park. The realigned bikeway would maintain the bicycle network. The realigned bikeway would maintain convenient and safe bicycle travel throughout the operational life of the project. The project would not conflict with this goal.
	Objective D Maintain and improve the quality, operation, and integrity of bikeway and walkway network	**Construction.** Construction of the project would temporarily disrupt bicycle and recreational access on Bike Route 20 within Frederick Allen Park for a period of seven

Local Transportation Program or Plan	Policy	Analysis
	facilities Objective D policy actions include: 1. Undertake routine maintenance of bikeway and walkway network facilities, such as sweeping bicycle lanes and sidewalks, as funding and priorities allow. 2. Ensure that repair and construction of transportation facilities minimizes disruption to the bicycling and walking environment to the extent practical. 3. Ensure that new bicycle and pedestrian improvements do not have a net negative impact on the environment. 4. Maximize opportunities to ensure that the pedestrian walkway network is accessible to, and usable by, persons with disabilities.	months. The disruption to the bicycle and walking environment is a significant impact. Mitigation Measure 3.13-1 requires detours for bicyclists and pedestrians to continue to provide safe bicycle and pedestrian access from Ross Commons to the College of Marin while the multi-use pathway is closed. The impact would be less than significant with mitigation. **Operation and Maintenance.** The District will provide routine maintenance of the realigned pathway as part of the project. The realigned multi-use pathway would not have a negative impact on the environment, as analyzed in Section 3.12 Recreation. The realigned pathway would drop gradually in grade and would meet Americans with Disabilities Act requirements. The pathway would be accessible to and usable by persons with disabilities. The project would not conflict with the policy actions.

As discussed in Table 3.13-2, the project could conflict with policies for maintaining safe bicycle and pedestrian travel and minimizing disruption to the bicycling and walking environment during construction while Bike Route 20 is closed and reconstructed within Frederick Allen Park. These potential conflicts would be a significant impact. Because **Mitigation Measure 3.13-1: Traffic Management** requires safe detours for bicyclists and pedestrians to avoid conflicts with the policies and plans, the impact would be less than significant with mitigation.

Mitigation: Implement Mitigation Measure 3.13-1.

Mitigation: Mitigation Measure 3.13-1: Traffic Management

Prior to initiation of construction, the Project contractor(s) shall use a qualified traffic engineer to prepare a Traffic Management Plan (TMP). The TMP shall be developed on the basis of detailed design plans. The TMP shall be reviewed and approved by the District and agencies with jurisdiction over roadways affected by project construction activities prior to construction. Once approved, the TMP shall be incorporated into the contract documents specification. The TMP shall include, but not necessarily be limited to, the elements listed below:

- Develop a detour plan for bicycle and pedestrian traffic that shows the approach to reroute traffic on Bike Route 20 to Poplar/Kent Avenue from the College of Marin Parking lot to Ross Common.
- Post signs providing public notice of detours at least 14 days prior to temporary bike route closure.
- Provide flaggers at the tennis courts within Frederick Allen Park to provide safe pedestrian access to the tennis courts.
- Control and monitor construction-vehicle movements by enforcing standard construction specifications through periodic on-site inspections.
- Install traffic-control devices where traffic conditions warrant, as specified in the applicable jurisdiction's standards (e.g., the California Manual on Uniform Traffic Control Devices; Part 6: Temporary Traffic Control); flaggers would be used, when warranted, to control vehicle movements.
- Implement a public information program to notify interested parties of the impending construction activities using means such as print media, radio, and/or web-based messages and information.
- Comply with roadside safety protocols to reduce the risk of accidents.
- Maintain access for emergency vehicles at all times. Provide advance notification to local police, fire, and emergency service providers of the timing, location, and duration of construction activities that could affect the movement of emergency vehicles on area roadways.
- Store all equipment and materials in designated contractor staging areas on or adjacent to the worksite in such a manner as to minimize obstruction to traffic.

Significance after Mitigation: Because Mitigation Measure 3.13-1 would safely reroute pedestrian and bicycle traffic onto adjacent safe routes with bicycle and pedestrian facilities, the project would avoid conflicts with policies and the impact would be less than significant with mitigation.

	Significance Determination
	Construction: Less than Significant
Impact 3.13-2: The project would not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).	**Operation and Maintenance: Less than Significant**

Construction

During construction, materials would be delivered to the project area using haul trucks. Construction would generate an average of 46 one-way trips per day over the construction period, with a maximum average of up to 94 one-way trips. The project would result in a temporary increase in the amount of truck trips. Guidance from OPR suggests that "new development projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact." (Office of Planning and Research, 2018) The average number of trips that would be generated during construction is

both temporary and less than 110 trips per day. Because the number of temporary vehicle trips generated during construction is below the numeric threshold at which a vehicle miles traveled (VMT) is considered potentially significant, the VMT impact during construction would be less than significant.

Operation and Maintenance

Once constructed, the project would require vehicle travel for maintenance activities including vegetation management, sediment and debris removal, stormwater pump station annual testing, and annual inspections. The District currently conducts routine maintenance and inspections of the flood control channel. The frequency of inspection and maintenance activities for the project would be similar to the District's inspection and maintenance for the existing flood control channel. The project would induce minimal VMT during the operation and maintenance phase, and therefore impacts would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.13-3: The project would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	**Construction: Less than Significant with Mitigation**
	Operation and Maintenance: Less than Significant

Construction

Frederick Allen Park

The Bike Route 20 segment within Frederick Allen Park would be temporarily closed during project construction, for a period of approximately seven months. Closure of a segment of Bike Route 20 could create hazardous conditions for bicyclists, pedestrians, and vehicles if bicyclists and pedestrians were routed to Sir Francis Drake Boulevard, which does not have safe bicycle and pedestrian facilities. The use of the multi-use path by construction equipment could also create hazardous conditions for bicyclists if the construction vehicles were not properly isolated from the bicycle traffic. The impact from increased hazards would be significant. **Mitigation Measure 3.13-1: Traffic Management** specifies requirements for detours of bicycle and pedestrian traffic to safely route bicyclists and pedestrians to Poplar and Kent Avenues and use flaggers to avoid conflicts between construction vehicles and bicyclists. Because Mitigation Measure 3.13-1 provides approaches to safely detours bicyclists and pedestrians during construction, the impact on bicycle safety from temporary closure of Bike Route 20 would be less than significant with mitigation.

Stormwater Pump Station and Unit 3 Dewatering

Project construction would require the temporary closure of one lane on College Avenue for up to two days during dewatering. A segment at the end of Laurel Avenue would also be closed for up to one month during construction of the stormwater pump station. The construction area for the stormwater pump station would be configured to allow access to the College of Marin around the construction area and not block travel to any residential streets. The lane closures

could cause increased traffic hazards, which would be a significant impact. **Mitigation Measure 3.13-1: Traffic Management** requires use of flaggers and illuminated signs to safely detour and redirect traffic around the work areas. Because the mitigation defines procedures for traffic safety during lane closures, the impact of lane closure on traffic hazards would be less than significant with mitigation.

Operation and Maintenance

After construction, the project would realign Bike Route 20 through Frederick Allen Park along the western edge of the park. The realigned pathway would be regraded with a one- to two-percent change in slope from existing grade. This minor change in grade and alignment from the existing condition would not noticeably change lines of sight or increase bicycle speeds. The alignment and change in grade would be very gradual as shown in the visual simulations provided in 3.1 Aesthetics. The realigned multi-use path would not create a hazard for bicyclists or pedestrians. Impacts would be less than significant.

> **Mitigation:** Implement Mitigation Measure 3.13-1: Traffic Management.
>
> **Significance after Mitigation:** Because the traffic management plan includes requirements for safe detours and use of flaggers to maintain pedestrians', bicyclists', and vehicle safety during bike-lane and traffic-lane closures, the impact would be less than significant with mitigation.

	Significance Determination
Impact 3.13-4: The project would not result in inadequate emergency access.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Construction

Construction-related truck traffic has the potential to occur during weekday peak hours, and therefore it could temporarily impede traffic flow, including for emergency service providers. The construction of the project site may require construction-vehicle use along nearby roadways, including Sir Francis Drake Boulevard, which is a main emergency or evacuation route for communities in West Marin (refer to Section 3.8 Hazards and Hazardous Materials for additional information). The project would not cause any lane or road closure on Sir Francis Drake Boulevard and would therefore not affect emergency evacuation, if needed.

Construction activities could result in temporary closure of one lane on College Avenue at the overcrossing of the Corte Madera Creek during installation of dewatering infrastructure. Temporary lane closure on College Avenue would occur for up to two days during installation and removal of the cofferdam (one day each). College Avenue is a four-lane road at the overcrossing of Corte Madera Creek. Vehicle access would remain open in both directions during single lane closure. The project would therefore not result in inadequate emergency access. The impact would be less than significant.

The end of Laurel Avenue, south of Cedar Avenue, may be closed for up to one month during construction of the stormwater pump station. Emergency vehicles would be able to travel

around the work area at the end of Laurel Avenue to access the College of Marin or allow for emergency evacuation from the College of Marin. The project would not result in inadequate emergency access because emergency vehicles would maintain ingress and egress access around the work area through construction. The impact on emergency access would therefore be less than significant.

Operation and Maintenance
The project would not include any alterations of existing roadway features that would cause a permanent change in access for emergency vehicles. Therefore, there would be no impact.

Mitigation: None required.

3.13.7 References

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3.14 Tribal Cultural Resources

3.14.1 Introduction

This section addresses the tribal cultural resources located within the project area. This section provides an overview of the environmental and regulatory settings that apply to the project. Also discussed in this section are the significance criteria used for determining environmental impacts, potential impacts associated with the project, and, where applicable, mitigation measures that would reduce those impacts to a less-than-significant level.

3.14.2 Scoping Comments

Comments related to tribal cultural resources impacts were received during the public scoping process. These comments and the location where they are addressed in the tribal cultural resources analysis are provided in Table 3.14-1.

Table 3.14-1 Tribal Cultural Resources Scoping Comments

Agency/Entity	Comment	Location in Tribal Cultural Resources Section that Comment is Addressed
Garril Page	I combine these two headings [Cultural Resources/Tribal Cultural Resources] as I have commented extensively on these subjects in prior EIR, and EIR/EIS opportunities. Having been told the USACE and County have collected such materials for inclusion in the current EIR, I herewith incorporate those Comments by reference. If, in fact, the current consultants have found and read my prior Comments, they have been advised regarding historical, cultural and tribal resources in Ross from 1960-2018. I assume the Town of Ross has mentioned relevant reports and resources for which Ross has contracted separately.	Section 3.14.3 (see also Section 3.4 Cultural Resources, 3.4.3 Environmental Setting, Project Setting, Record Search)
Garril Page	I will add that the FAP Riparian Corridor proposes excavation and land disturbance in areas of early tribal settlements. The Project lead agency must exercise extreme diligence in honoring artifacts uncovered in the project area.	3.14.4 Regulatory Setting, Regional and Local Regulations

3.14.3 Environmental Setting

Project Setting

The project area is located in the ancestral territory of the Habasto tribelet of the Coast Miwok. Ethnographic information on the Coast Miwok is provided in Subsection 3.4.3 Ethnographic Context of Section 3.4 Cultural Resources.

Native American Consultation

A request was made to the Native American Heritage Commission (NAHC) on June 15, 2020, to review its files for the presence of sacred sites at or near the project location. The NAHC replied on June 16, 2020, stating that a search of their files did not identify the presence of significant tribal resources in or near the project area.

The District sent project-notification letters to two tribes (see Table 3.14-2) for the purpose of consultation as required by Public Resources Code (PRC) Section 21080.3.1. The letters were sent via U.S. Certified Mail with a return receipt on June 23, 2020. Follow-up emails were sent on August 5, 2020. The Federated Indians of Graton Rancheria (FIGR) responded in an emailed letter dated August 6, 2020, in which they formally requested consultation on the project. Per their request, confidential record-search information was forwarded to the tribe on August 21, 2020. The Ione Band of Miwok Indians did not respond to the notification letter or follow-up email. All correspondence related to PRC Section 21080.3.1 is presented in Appendix E.

Table 3.14-2 Native American AB 52 Consultation

Contact	Tribe	Letter Date	Email Follow-up Date	Next Steps
Buffy McQuillen Tribal Heritage Preservation Officer	Federated Indians of Graton Rancheria	June 23, 2020	August 5, 2020	August 6, 2020: FIGR responded in an emailed letter. August 21, 2020: Confidential record search information was forwarded to the tribe. October 21, 2020; District sent a follow-up email to the Tribe to ask if they wished to consult further on the project. December 3, 2020; District sent follow-up email to the Tribe to request review of Mitigation Measure 3.4-2. December 8, 2020: FIGR accepted Mitigation Measure 3.4-2.
Sara D. Setshwaelo, Chairperson	Ione Band of Miwok Indians	June 23, 2020	August 5, 2020	No response received as of the date of this Draft EIR.

The District entered into formal consultation with the FIGR on August 21, 2020. However, the District has not yet received any information from the tribe regarding tribal cultural resources. The District wrote to the FIGR in an email on December 3, 2020, providing them with the mitigation measure for review and requesting conclusion of consultation if the tribe has no comments. FIGR responded in email on December 8, 2020, accepting the mitigation measure and concluding consultation on the project.

3.14.4 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project and are defined as standard conditions for the project.

Federal Regulations

National Historic Preservation Act

Federal law does not address tribal cultural resources; however, a tribal cultural resource may qualify as a traditional cultural property (TCP) and be considered a historic property as eligible for listing in the National Register of Historic Places (NRHP) (see Section 3.4 Cultural Resources for full discussion). TCPs are locations of cultural value that are historic properties. A place of cultural value is eligible as a TCP "because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (Parker & King, 1990). A TCP must be a tangible property, meaning that it must be a place with a referenced location, and it must have continually been a part of the community's cultural practices and beliefs for the past 50 years or more. Unlike tribal cultural resources, TCPs can be associated with communities other than Native American tribes although the resources are usually associated with tribes. By definition, TCPs are historic properties; that is, they meet the eligibility criteria as a historic property for listing in the NRHP. Therefore, as historic properties, TCPs must be treated according to the implementing regulations found under Title 36 CFR § 800, as amended in 2001.

State Regulations

California Register of Historical Resources

PRC Section 5024.1 is a listing of those properties that are to be protected from substantial adverse change, and it includes properties that are listed, or have been formally determined to be eligible for listing, in the NRHP, State Historical Landmarks, and eligible Points of Historical Interest (see Section 3.4 Cultural Resources for a full description).

Assembly Bill 52

The California State Legislature passed Assembly Bill (AB) 52, which added language to the PRC regarding the evaluation of impacts on tribal cultural resources under CEQA, and which requires consultation with California Native American tribes with a traditional and cultural affiliation with a project area. AB 52 requires lead agencies to analyze project impacts on tribal cultural resources separately from archaeological resources (PRC Sections 21074, 21083.09). AB 52 defines tribal cultural resources in a new section of the PRC (Section 21074). AB 52 also requires lead agencies to engage in additional consultation procedures with respect to California Native American tribes (PRC Sections 21080.3.1, 21080.3.2, 21082.3).

Specifically, PRC Section 21084.3 states the following:

1. Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.
2. If the lead agency determines that a project may cause a substantial adverse change to a tribal cultural resource, and measures are not otherwise identified in

the consultation process provided in Section 21080.3.2, the following are examples of mitigation measures that, if feasible, may be considered to avoid or minimize the significant adverse impacts:

a. Avoidance and preservation of the resources in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
    i. Protecting the cultural character and integrity of the resource.
    ii. Protecting the traditional use of the resource.
    iii. Protecting the confidentiality of the resource.
c. Permanent conservation easements or other interests in real property, with culturally
d. Appropriate management criteria for the purposes of preserving or utilizing the resources or places.
e. Protecting the resource.

In addition, the Office of Planning and Research updated Appendix G of the CEQA Guidelines to provide sample questions regarding impacts on tribal cultural resources (PRC Section 21083.09).

Public Ressources Code

PRC Section 21074

Tribal cultural resources have the following meaning under PRC Section 21074(a):

1. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
    a. Included or determined to be eligible for inclusion in the CRHR.
    b. Included in a local register of historical resources as defined in PRC Section 5020.1(k).
2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC Section 5024.1(c). In applying the criteria set forth in PRC Section 5024.1(c), the lead agency shall consider the significance of the resource to a California Native American tribe.
3. A cultural landscape that meets the criteria of PRC Section 21074(a) if the landscape is geographically defined in terms of the size and scope.
4. A historical resource as described in PRC Section 21084.1, a unique archaeological resource as defined in PRC Section 21083.2, or a non-unique archaeological

resource as defined in PRC Section 21083.2 may also be a tribal cultural resource if it meets the criteria of PRC Section 21074(a).

PRC Section 5020.1

According to CEQA Guidelines Section 15064.5, the term "historical resources" includes resources that are listed in a local register. As defined in PRC Section 5020.1(k), "local register of historical resources" means a list of properties officially designated or recognized as historically significant by a local government pursuant to a local ordinance or resolution.

PRC Section 5024.1

A Lead Agency, in its discretion and supported by substantial evidence, may determine a resource to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. As defined in PRC Section 5024.1, a resource may be listed as an historical resource in the California Register if it meets any of the following NRHP 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.

PRC Sections 5097.98-5097.991

PRC Sections 5097.98-5097.991 discuss the procedures to follow up on the discovery of Native American human remains. They also establish that it is a felony to obtain or possess Native American artifacts or human remains taken from a grave or cairn (see Section 3.4 Cultural Resources for a full description).

California Native American Graves Protection and Repatriation Act

The California Native American Graves Protection and Repatriation Act of 2001 is the State repatriation policy for Native American remains (see Section 3.4 Cultural Resources, for a full description).

Regional and Local Regulations

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan are relevant to the project:

> **HAR-1.1: Preserve Historical and Archaeological Resources**. Identify archaeological and historical resource sites.
>
> **HAR-1.2: Document Historical Information**. Provide documents, photographs, and other historical information whenever possible to be catalogued in the Anne T. Kent California Room in the Marin County Free Library.

HAR-1.3: Avoid Impacts to Historical and Archaeological Resources. Ensure that human activity avoids damaging cultural resources, where feasible.

Marin County Development Code

Marin County has the following code section to ensure that the construction of new development and the establishment of new and modified uses contribute to the maintenance of a stable and healthy environment, that new development is harmonious in character with existing and future development, and that the use and enjoyment of neighboring properties are protected, as established in the Countywide Plan.

22.20.040: Archaeological and Historic Resources. In the event that archaeological or historic resources are discovered during any construction, construction activities shall cease, and the Agency shall be notified so that the extent and location of discovered materials may be recorded by a qualified archaeologist, and disposition of artifacts may occur in compliance with State and Federal law. The disturbance of an Indian midden may require the issuance of an Excavation Permit by the Department of Public Works, in compliance with Chapter 5.32 (Excavating Indian Middens) of the County Code.

Town of Ross General Plan

The following policies of the Town of Ross General Plan related to tribal cultural resources are applicable to the project (Town of Ross, 2007).

Goal 4. Protecting Historic Places and Resources

4.5 Archaeological Resources. Implement measures to preserve and protect archaeological resources. Whenever possible, identify archaeological resources and potential impacts on such resources. Provide information and direction to property owners in order to make them aware of these resources. Require archaeological surveys, conducted by an archaeologist who appears on the Northwest Information Center's list of archaeologists qualified to do historic preservation fieldwork in Marin County, in areas of documented archaeological sensitivity. Develop design review standards for projects that may potentially impact cultural resources.

3.14.5 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project could have a significant impact if it would:

a. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k); or
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to changes in tribal cultural resources impacts in the project area. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. Impact evaluations are assessed based on the existing conditions described earlier in this section.

3.14.6 Impact Discussion

Impact Analyzed

Impact 3.14-1: The project could cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: i. **Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k); or** ii. **A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.**	**Significance Determination**
	Construction: Less than Significant with Mitigation
	Operation and Maintenance: No Impact

Construction

As discussed in Section 3.4 Cultural Resources, there are no known historical resources that are listed or eligible for listing in the CRHR in the project area. The project would not impact any known tribal cultural resource that is listed or eligible for listing in the CRHR. However, construction of the project could discover archaeological deposits that local tribes deem to be tribal cultural resources, as defined under PRC Section 21074(a); this is particularly applicable to

the discovery of human remains. The discovery of tribal cultural resources could result in significant impacts on the resources if they were not properly managed.

Archaeological resources discovered during construction would be subject to **Mitigation Measure 3.4-2: Inadvertent Discoveries of Archaeological Resources**, which requires stopping work within 50 feet of uncovered archaeological resources, and requiring examination of the finds by a qualified archaeologist. The discovery of a Native American resource, which could be determined to be a tribal cultural resource, would require the involvement of a Native American representative. The mitigation measure, furthermore, requires that tribal cultural resources be treated according to PRC 21084.3, by considering all preservation options that include avoidance and preservation in place or otherwise treating the resource with culturally appropriate dignity.

By following the procedures in Mitigation Measure 3.4-2, the District would avoid substantial adverse changes in the significance of an archaeological resource that are also tribal cultural resources; therefore, the impact on tribal cultural resources would be less than significant with mitigation.

Operation and Maintenance

Operation and maintenance of the project will not involve ground-disturbing activities. The proposed project elements include a more natural channel in Frederick Allen Park and within the lower College of Marin reach in Unit 2. Operation and maintenance of the project would have no impact on tribal cultural resources.

> **Mitigation:** Implement Mitigation Measure 3.4-2.
>
> **Significance after Mitigation:** Mitigation Measure 3.4-2 specifies procedures to avoid adverse effects to archaeological resources by stopping work when archaeological materials are discovered, evaluating the significance of the find, and developing appropriate treatment to protect the site or mitigate impacts. Should the archaeological resource also be determined to be a tribal cultural resource, the mitigation measure requires application of treatments under PRC 21084.3. Avoidance and preservation in place would be the preferred option, followed by other measures preserves or restores the cultural character and integrity of a tribal cultural resource. As a result, the impact on archaeological resources would be less than significant with mitigation.

3.14.7 References

Marin County . (2007, November 6). Marin Countywide Plan.

Marin County. (1994, May 17). Environmental Impact Review Guidelines (EIR Guidelines). *Policy and Procedures for Implementation of the California Environmental Quality Act (CEQA)*.

Parker, P. L., & King, T. F. (1990). Guidelines for Evaluating and Documenting Traditional Cultural Properties. National Register Publication 38. National Park Service, Washington, DC. Revised 1998.

Town of Ross. (2007, June). Town of Ross General Plan.

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3.15 Utilities and Service Systems

3.15.1 Introduction

This section describes existing utilities and service systems in the vicinity of the project, including water supply, wastewater management services, solid waste management services, electricity, and natural gas. The analysis is based on review of available maps of the project area and vicinity. This section also includes relevant regulations, a discussion of potential project impacts, and appropriate mitigation measures, where necessary. No scoping comments relevant to evaluation of utilities and service systems were provided during the public scoping period.

3.15.2 Environmental Setting

Water Supply

The Marin Municipal Water District (MMWD) is a public agency that serves approximately 191,300 customers in south and central Marin County. The MMWD provides water to the project area for domestic, commercial, and firefighting use. The MMWD facilities include seven reservoirs, four water-treatment plants, and various storage tanks, pumps, and distribution mains (MMWD, 2020). The water supply comes from a network of seven local rain-fed reservoirs. The MMWD estimated that the operational yield of their reservoirs is about 20,000-acre feet per year (MMWD, 2016), which is equivalent to 6.5 billion gallons per year.[1] Non-potable water is available from local groundwater wells located in the Town of Ross (Marin County, 2005). There are three groundwater basins that are at least partially within the MMWD's service area. These three basins include Ross Valley, San Rafael Valley, and part of the Novato Basin.

Several MMWD water and stormwater lines are located within the project area. There are water supply and stormwater lines that cross the creek just upstream of Lagunitas Road Bridge in Unit 4. Water pipelines are also adjacent to the southern end of Unit 4 and parallel parts of Bike Route 20. Two stormwater lines are located near the proposed storm drain pump station in Unit 3. Smaller stormwater lines are scattered throughout Unit 3 and Unit 2. One water pipeline crosses the creek at Stadium Way in Unit 2. See Figure 3.15-1 to Figure 3.15-3 for locations of water pipelines in the project area.

Wastewater Management Services

The Ross Valley Sanitary District (RVSD) is the oldest sanitary district in California. The RVSD operates and maintains approximately 200 miles of collection sewer lines and 19 pumping stations, which collect, pump, and transport approximately four million gallons of wastewater

[1] One acre-foot is equivalent to 325,851 gallons of water.

per day to the Central Marin Sanitation Agency for treatment. The RVSD boundaries include 26.75 square miles of the Ross Valley watershed, including the project area. The RVSD also serves wastewater collection systems in Murray Park (RSVD, 2020).

RVSD sanitary sewer lines run beneath Corte Madera Creek in a northwest/southeast direction within the project area from the southern end of Unit 4 near the fish ladder to near the end of Unit 2. The sewer lines cross beneath Corte Madera Creek at the approximate location of the fish ladder and at Stadium Way in Unit 2 (refer to Figure 3.15-1 to Figure 3.15-3). An aboveground sewer pipe crosses the creek on the pedestrian bridge at the end of Stadium Way (Figure 3.15-3).

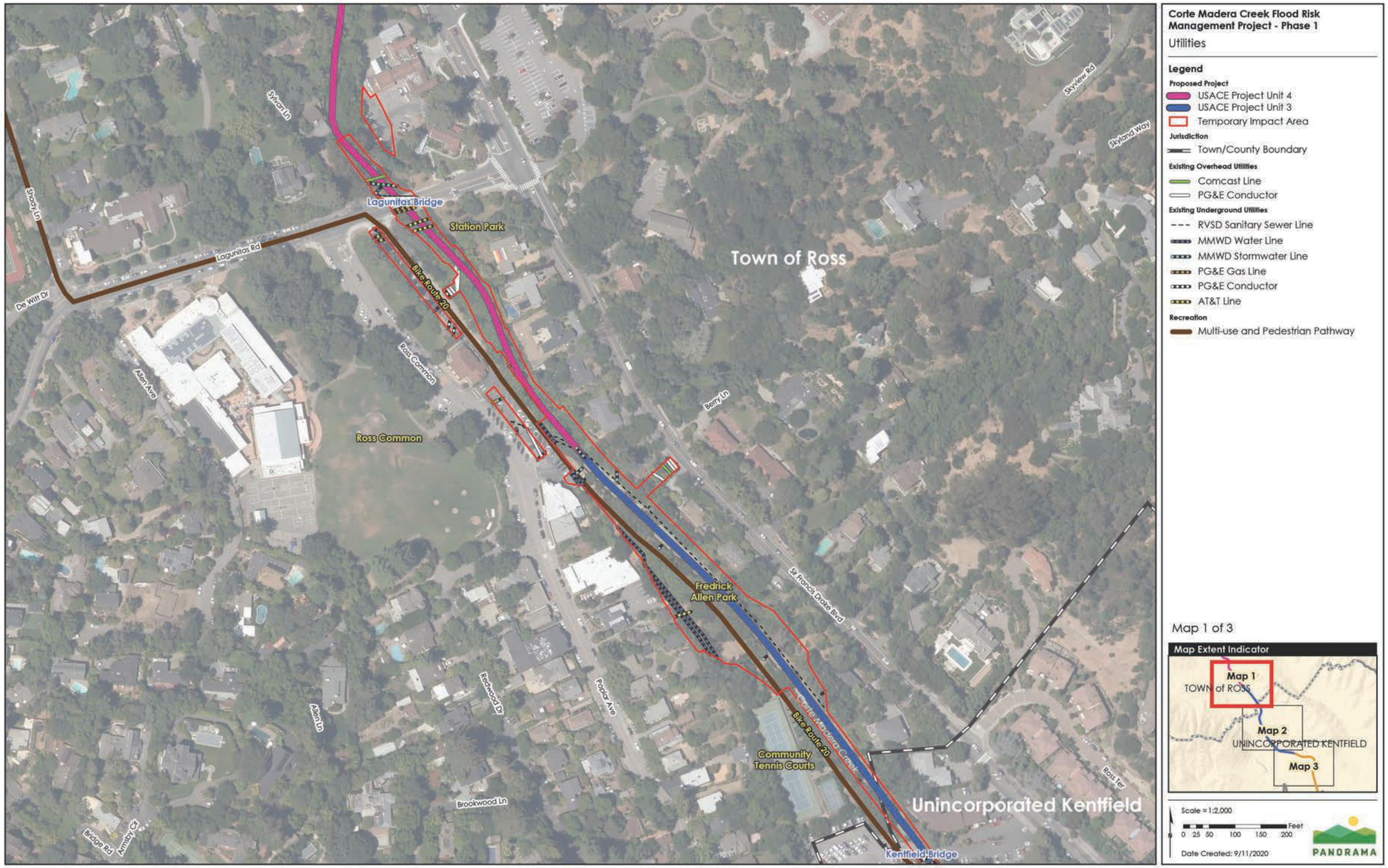
Solid Waste Management Services

The Marin Sanitary Service is responsible for solid waste disposal in central Marin County. It serves more than 32,000 residential and commercial accounts in San Rafael, San Anselmo, Fairfax, Ross, Corte Madera, Larkspur, and other unincorporated areas of Marin County (Marin Sanitary Service, 2020). The Marin Sanitary Service operates the Resource Recovery and Recycling Plant and a transfer station where waste from commercial collectors is collected then transported by truck to Redwood Landfill (USACE, 2010). The Redwood Landfill, operated by Waste Management, located in northern Marin County (projected to close in 2039), is the primary landfill for residential and commercial wastes generated in the vicinity of and within the project area. The current permitted capacity of the landfill is 19.1 million cubic yards, with a permitted daily disposal rate of 2,310 tons (Waste Management, 2020).

Electricity and Natural Gas

Pacific Gas and Electric (PG&E) provides electricity and natural gas services for all of Marin County. PG&E obtains its energy supplies from power plants and natural gas fields in northern California and from energy purchased outside its service area, which is delivered through high-voltage transmission lines and pipelines. Much of the County's electricity comes from geothermal plants in the nearby Geysers region. There are no power plants located in Marin County. Marin Clean Energy procures renewable sources of electricity and partners with PG&E to deliver electricity.

Figure 3.15-1 Utilities and Service Systems in the Project Area (Map 1 of 3)



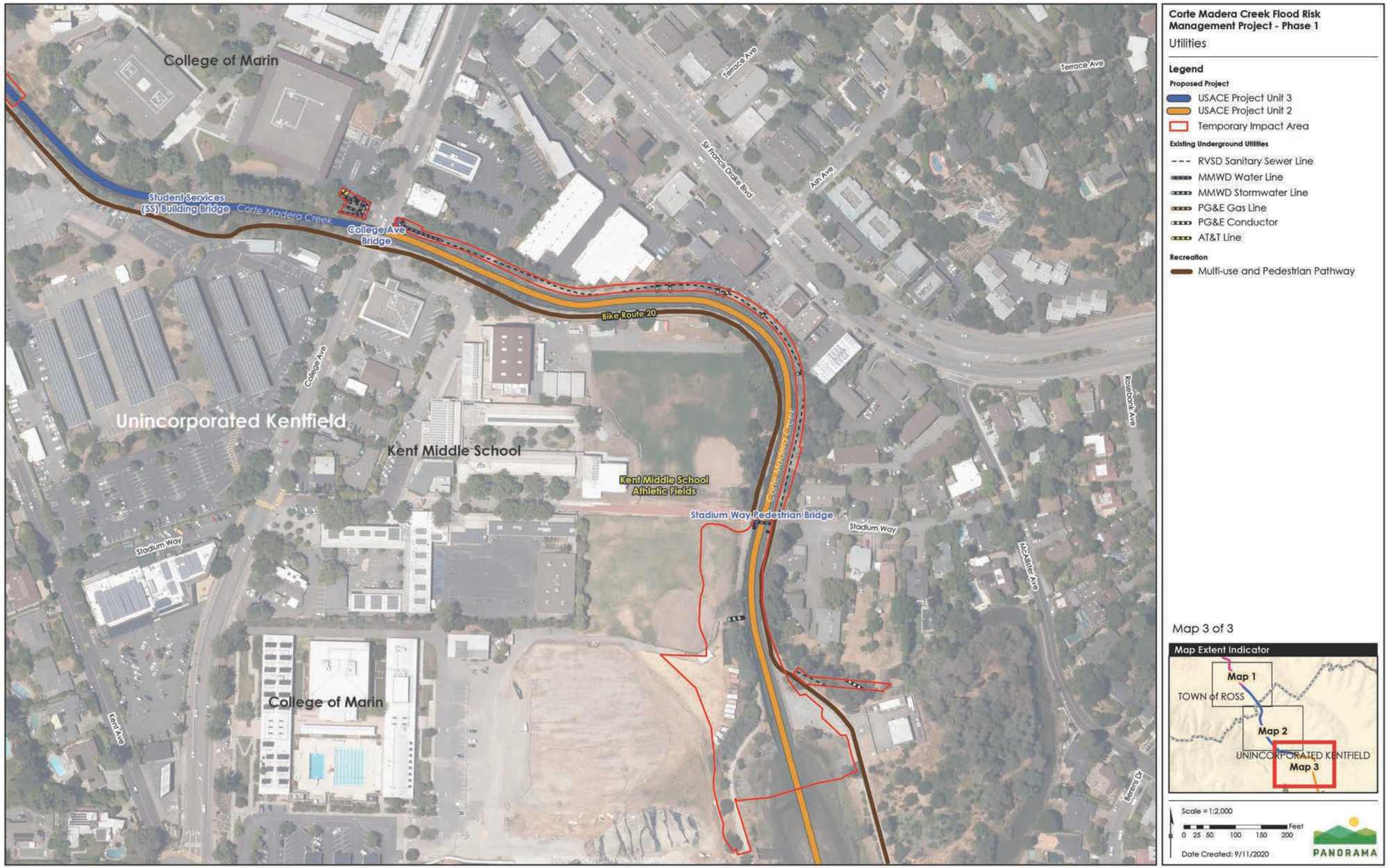
Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, GHD 2020, Prunuske Chatham, Inc. 2020, Golden Gate National Parks Conservancy 2018, Marin County Flood Control and Water Conservation District 2015, PG&E 2020)

Figure 3.15-2 Utilities and Service Systems in the Project Area (Map 2 of 3)



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, GHD 2020, Prunuske Chatham, Inc. 2020, Golden Gate National Parks Conservancy 2018, Marin County Flood Control and Water Conservation District 2015, PG&E 2020)

Figure 3.15-3 Utilities and Service Systems in the Project Area (Map 3 of 3)



Sources *(Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, GHD 2020, Prunuske Chatham, Inc. 2020, Golden Gate National Parks Conservancy 2018, Marin County Flood Control and Water Conservation District 2015, PG&E 2020)*

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The PG&E utility system in the project area consists of underground gas lines and conductors crossing the creek at Lagunitas Road Bridge; overhead and underground conductors adjacent to the Unit 4 grading area; overhead conductors within proposed staging areas along Unit 4 and Unit 3, underground conductors at Kentfield Bridge, and an overhead conductor near Locust Avenue; underground gas lines adjacent to the proposed stormwater pump station at the end of Laurel Avenue; and an underground conductor at the lower end of Unit 2. See Figure 3.15-1 to Figure 3.15-3 for locations of PG&E utility infrastructure in the project area.

Communication System

Existing communication services (including cable, telephone, and internet services) in the project area are provided by Comcast and AT&T. Overhead Comcast lines cross the creek upstream of Lagunitas Road Bridge, within the proposed staging area south of Berry Lane, and within the proposed staging area at Locust Avenue. AT&T lines run underground and cross the creek at Lagunitas Road Bridge in Unit 4, Frederick Allen Park in Unit 3, College Avenue Bridge at the lower end of Unit 3, and along Unit 2. See Figure 3.15-1 to Figure 3.15-3 for locations of the communication system in the project area.

College of Marin Infrastructure

The College of Marin (COM) has its own underground utility network serving the College of Marin Kentfield Campus, located directly adjacent to the left and right bank of Unit 2 and adjacent to the left bank of Unit 3 along Corte Madera Creek. The existing COM utility lines cross the creek at one location just north of the SMN Building Bridge. They also parallel both sides of the creek within proposed staging areas near the SMN Building Bridge and the proposed stormwater pump station. Several lines are also located along the left bank of the creek flanking both sides of College Avenue Bridge.

3.15.3 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

Federal Regulations

Although there are multiple federal laws, statutes, and regulations that would generally apply to the project, the federal government and its agencies have delegated the authority to implement and satisfy those requirements relevant to utilities and service systems to the state of California and its agencies, as discussed below.

State Regulations

California's Integrated Waste Management Act of 1989

The California Integrated Waste Management Act of 1989 (Public Resources Code, Division 30), enacted through Assembly Bill 939 and modified by subsequent legislation, requires all California cities and counties to implement programs to reduce, recycle, and compost at least 50 percent of wastes by the year 2000 and establishes the goal of diverting at least 75 percent of

generated waste (based on per capita disposal rates) by 2020.[2] A jurisdiction's diversion rate is the percentage of the total waste that a jurisdiction diverts from disposal through reduction, reuse, and recycling programs.

The law requires all California counties in coordination with their respective cities to develop and implement integrated waste management plans. As part of their integrated waste management plans, counties must ensure that a minimum of 15 years of disposal capacity is available to serve the county and its cities. Since 2007, the achievement of waste-diversion rates has been measured based on per-capita disposal rates, expressed in pounds per person per day of wastes disposed of in landfills. To achieve the target waste-diversion rates, the California Department of Resources Recycling and Recovery (CalRecycle) established a target disposal rate of 7.6 pounds per person per day in Marin County in 2018 (CalRecycle, 2018).

Regional and Local Regulations

Marin Hazardous and Solid Waste Management Joint Powers Authority

The Marin Hazardous and Solid Waste Management Joint Powers Authority, referred to as Zero Waste Marin, ensures Marin County's compliance with state recycling mandates and provides residents and businesses with information on household hazardous waste collection, recycling, composting, and waste disposal (Zero Waste Marin, 2020a). Zero Waste Marin was formed by the County of Marin and its incorporated cities and towns (Belvedere, Corte Madera, Fairfax, Larkspur, Mill Valley, Novato, Ross, San Anselmo, San Rafael, Sausalito, Tiburon). It was formed in 1996 to ensure the County's compliance with the waste-diversion disposal goals mandated by California's Integrated Waste Management Act. Zero Waste Marin worked in partnership with County agencies, private waste haulers, and facility operators to develop and implement the Integrated Waste Management Plan to comply with state mandates (Zero Waste Marin, 2020a).

Marin Countywide Plan

The following goals and policies in the Marin Countywide Plan are relevant to the project (Marin County , 2007).

Public Facilities and Services

Goal PFS-1: Adequate Public Facilities and Services. Provide basic public facilities to accommodate the level of development planned by cities and towns and the County.

> ***Policy PFS-1.1: Require Cost-Sharing.*** Require new development to pay for the infrastructure it requires and the public services it receives.

[2] California Public Resources Code Division 30, Sections 40000-49620.

Policy PFS-1.2: Plan Effectively to Minimize Costs. Plan public facilities in cooperation with service providers to minimize short- and long-term construction, operation, and maintenance costs.

Policy PFS-1.3: Discourage Privatization and Commercialization. Encourage public ownership of utilities and public service facilities by not authorizing privatization of water, sewer, law enforcement, emergency service, school, and other essential services. Consider prohibiting corporate sponsorship and commercially driven naming rights of public facilities and lands as a means to fund maintenance and improvements.

Policy PFS-1.4: Reduce Demand on Public Facilities. Reduce per capita and total demand for water and wastewater treatment, and enhance stormwater management through integrated and cost-effective design, technology, and demand reduction standards for new development and redevelopment.

Goal PFS-2: Sustainable Water Resources. Assure a reliable, sustainable water supply for existing and future development while protecting the natural environment.

Policy PFS-2.1: Conserve Water and Utilize Sustainable Sources. Promote conservation to increase the responsible use and reliability of water supplies. Reduce the waste of potable water through efficient technologies, design, and management practices, and through better matching of the source and quality of water to the user's needs.

Policy PFS-2.2: Mitigate Increased Water Demand in New Development. Work with local water agencies to mitigate increases in water demand due to new development by supporting water efficiency programs that decrease demand by a similar amount.

Policy PFS-2.3: Manage Water Resources Sustainably. Manage water resources to ensure equitable amounts of clean water for all users, to support wildlife habitat, and to preserve natural resources within the sustainable limits of water supplies (See also the Natural Systems and Agriculture Element, Water Resources Section of the Marin Countywide Plan).

Goal PFS-3: Reduction, Safe Processing, and Reuse of Wastewater. Continue to enhance the Alternative Onsite Wastewater Monitoring Program. This program ensures the proper operation of alternative and innovative wastewater system designs. Continue to work with manufacturers, designers, installers, end users, and the Regional Water Quality Control Board to evaluate the effectiveness and capabilities of these alternatives to traditional septic system designs. Work with stakeholders to periodically update design guidelines and regulations in light of evolving best practices.

Policy PFS-3.1: Reduce Toxics in Wastewater. Minimize the potential for pollution to water and other resources from sewage treatment.

Policy PFS-3.2: Promote Alternative Wastewater Systems. Enhance water quality through use of alternative wastewater treatment methods.

Policy PFS-3.3: Reduce Stormwater Volume. Implement appropriate upstream water saving technologies to reduce stormwater volumes and increase percolation. Increase permeable surfaces and encourage onsite percolation to reduce stormwater volume and potential overflow of wastewater treatment facilities.

Goal PFS-4: Efficient Processing and Reduced Landfill Disposal of Solid Waste. Minimize, treat, and safely process solid waste materials in a manner that protects natural resources from pollution while planning for the eventual reuse or recycling of discarded material to achieve zero waste.

Policy PFS-4.1: Reduce the Solid Waste Stream. Promote the highest and best use of discarded materials through redesign, reuse, composting, and shared producer responsibility. Emphasize a closed-loop system of production and consumption.

Policy PFS-4.2: Protect Environmental Health. Require the use of waste processing and disposal techniques that prevent the contamination or other impairment of natural resources.

Policy PFS-4.3: Plan for Waste Transformation or Disposal. Plan for the transformation or elimination of waste materials that cannot be reduced, recycled, or composted.

Policy PFS-4.4: Promote Regulatory Efforts. Support state legislative or regulatory efforts that will aid in achieving zero waste.

Town of Ross Municipal Code

The following codes of the Town of Ross Municipal Code related utilities and service systems are applicable to the project (Town of Ross, 2020).

Chapter 12.04 Excavations

12.04.010 Permit Required. It is unlawful for any person to cut, open, excavate or tear up any portion of any street, lane, avenue, public thoroughfare, or other public property within the town, for the purpose of laying, replacing or repairing any pipe, conduit or sewer therein, or for any other purpose whatsoever, without first obtaining a permit therefor and making a deposit with the superintendent of streets (Prior code §7100).

12.04.020 Notification to superintendent of streets. Any person desiring to cut, open, excavate or tear up any portion of any street, lane, avenue, public thoroughfare or other public property within the town, for the purpose of laying, replacing or repairing any pipe, conduit or sewer therein, or for any other purpose whatsoever, shall, before proceeding with the work, notify the superintendent of streets of the character and extent of the work proposed to be done and obtain from the superintendent of streets a permit to proceed with the work as the same shall be described in the permit (Prior code §7101).

3.15.4 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines, the project would have a significant impact if it would:

a. Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects;
b. Have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years;
c. Result in a determination by the wastewater treatment provider which serves or may serve the project that is has inadequate 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; or
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to utilities and service systems for the project. This section includes an analysis of potential short-term (construction) and long-term (operation) impacts of the project. The analysis assesses whether the project would require the construction of new utility infrastructure or relocation of existing infrastructure, the implementation of which may result in adverse environmental effects. For landfill capacity and compliance with solid waste regulations, the analysis compares the quantity of solid waste that would be generated, adjusted to reflect applicable waste-diversion regulations, with available landfill capacity. Impact evaluations are assessed based on the existing conditions described earlier in this section. Mitigation measures are identified, as necessary, to reduce significant impacts.

3.15.5 Impact Discussion

Impact Analyzed

Impact 3.15-1: The project would not 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.	**Significance Determination**
	Construction: Less than Significant
	Operation and Maintenance: Less than Significant

Construction

Water Facilities

Water facilities near the Corte Madera Creek channel include MMWD water lines and COM utility lines, which may include water. Project construction would require water for the purpose of dust control and soil stabilization. Water trucks would apply water to the site as necessary to control dust. The estimated construction water demand is 642,366 gallons of water. The project water demand would be well below the MMWD operational yield of 6.5 billion gallons of water. The operational water use would also be temporary and would not create a need for additional water treatment capacity.

As described in Section 3.15.2, there are existing water supply lines that cross the creek at Lagunitas Road Bridge and Stadium Way and along Bike Route 20 in Unit 4 and Frederick Allen Park. The locations of these water lines are incorporated into the project design and would be avoided during construction. Clear instructions would be provided to work crews to allow the project to proceed in areas around existing utilities without causing inadvertent damage. If it is determined at any point that an existing infrastructure is at risk, the project would be modified in the final design to avoid the damage existing water lines. The impacts would be less than significant.

Wastewater Treatment and Storm Water Drainage Facilities

Wastewater would be generated during construction from worker sanitary facilities and from process-related use. The minimal amount of wastewater generated by workers and process wastewater generated during construction would not exceed the treatment capacity of the RVSD facilities.

RVSD sanitary sewer lines and MMWD stormwater lines are located within and near the project area. RVSD sewer lines parallel the majority of Corte Madera Creek along Units 4, 3, and 2 and cross Corte Madera Creek at the transition between Unit 4 and 3. MMWD stormwater lines cross the creek just upstream of Lagunitas Road Bridge in Unit 4, at the proposed stormwater pump station in Unit 3, and at several locations throughout Unit 3 and Unit 2. The existing RVSD sewer pipelines locations have been identified and incorporated into the project design. The District will obtain RVSD approval for the design where the creek channel crosses RVSD facilities at the transition from Unit 4 to Unit 3. Locations of sewer and stormwater pipelines are well documented, and construction would be planned around these features. Clear instructions would be provided to work crews to allow the project to proceed in areas around existing utilities without causing inadvertent damage. If it is determined at any point that an existing

infrastructure facility is at risk, the project would be modified in the final design to avoid the danger. The impacts on stormwater and wastewater pipelines would be less than significant.

The project includes construction of a new stormwater facility, the stormwater pump station in the Granton Park area. The stormwater pump station is part of the project, and the impacts from construction of the pump station are addressed in this EIR. Construction of the stormwater pump station will not adversely affect the existing stormwater facilities in the area.

Electric Power, Natural Gas, and Communication System Facilities

Electric power, natural gas, and communication-system facilities near the Corte Madera Creek channel include gas pipelines, electrical lines, and communications and power conduits. As described in Section 3.15.2, the PG&E utility system in the project area consists of underground gas lines and electric conductors crossing and paralleling the creek along various locations in Units 4, 3, and 2. Existing communication services (including cable, telephone, and internet services) in the project area are provided by Comcast and AT&T. The existing power, gas, and communication lines in the project area have been documented. The project has been designed to avoid electric power, natural gas, and communications lines in the area. Prior to construction, the location of utilities will be marked in the field to ensure that workers avoid inadvertent damage to buried electrical, natural gas, and communications lines. If it is determined at any point that an existing utility structure is at risk, the project would be modified to avoid the danger. No electric power, natural gas, or communication-system facilities would be removed or decommissioned. The project would require a new tap to the PG&E electrical line at the stormwater pump station. The electrical line extension would be a few feet from the existing line at Cedar Avenue. Construction of the new electrical connection would not cause any significant environmental effects. The impact on electric power, natural gas, and communications lines would be less than significant for the reasons described above.

Operation and Maintenance

Project operation would not create any permanent employment that could indirectly result in demand for utilities. Operation of the new project components would not require water or generate wastewater. Operation of the project would require a small amount of power to generate the new stormwater pump station and supply of fuel as backup power for the emergency generator. The stormwater pump station would only operate a few days per year (up to 66) during and following storm events when the pump station is needed to avoid flooding in the Granton Park area. The amount of power required for the pump station would not require construction or expansion of any electrical or gas facilities because PG&E has sufficient electrical supply to power the pump station, and the impact would be less than significant.

Operation and maintenance of the project would not create any permanent employment that would indirectly cause new utility demand or indirectly require relocation or construction of new utilities. Therefore, there would be no indirect impact on utility construction, expansion, or relocation.

Mitigation: None required.

	Significance Determination
Impact 3.15-2: The project would have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Construction

The MMWD supplies water within Marin County, including the project area. The water supply comes from a network of seven local, rain-fed reservoirs. Non-potable water is available from local groundwater wells located in the Town of Ross (Marin County, 2005).

Project construction would require water for the purpose of dust control and soil stabilization. It is estimated that these construction activities could require 642,366 gallons of water during the seven-month construction period. Water trucks would apply water to the site as necessary to control dust. Construction would also use relatively small amounts of potable water for some site needs such as drinking water, hand washing, and other on-site sanitary needs. The increase in water demand would be temporary and limited to the seven-month construction period. Water supplies are planned such that short-term spikes in potable use can be accommodated, and there would be no need for new or expanded water supplies or water-treatment facilities. The MMWD estimated that the operational yield of their reservoirs is about 20,000 acre-feet per year (MMWD, 2016), which equivalent to 6.5 billion gallons per year.[3] The anticipated 642,366 gallons of water needed for project construction in one year would be a fraction of MMWD's capacity. Construction of the proposed project would not require more potable water supply than would be available during normal, dry, or multiple dry years because of the limited amount of water required and short-term nature of the project demand; therefore, the impact on water supplies would be less than significant.

Operation and Maintenance

Operation of the project would not require water and would not create demand for additional water supplies; therefore, no impact on water supplies would occur.

Mitigation: None required.

	Significance Determination
Impact 3.15-3: The project would not result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Construction

During project construction, new sources of wastewater discharges would include wastewater resulting from sanitary needs of construction workers. As described in Chapter 2 Project

[3] One acre foot if 325,851 gallons, water enough to cover one acre to a depth of one foot.

Description, the maximum construction workforce would be approximately 10 workers per day. Assuming that each worker would generate 1.28 gallons per day of wastewater,[4] the total increase in wastewater volumes would be less than 0.001 million gallons per day, an increase well within the dry-weather capacity of the RVSD; therefore, the impact on wastewater treatment capacity would be less than significant.

Operation and Maintenance

The project would not generate wastewater during operations, and no staffed operational facilities are proposed as part of the project. There would be no impact on wastewater treatment capacity during operation and maintenance.

Mitigation: None required.

	Significance Determination
Impact 3.15-4: The project would not 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.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Construction

As described in Chapter 2 Project Description, demolition and total project earthwork would generate approximately 23,130 cubic yards of demolition debris and soil. Of the 23,130 cubic yards of soil that is excavated, approximately 7,585 cubic yards may be beneficially reused in the project as fill material. The excess excavated soil materials (15,145 cubic yards) would be removed from the site. The demolition debris and soil, including the concrete, is anticipated to be recycled at the Marin Resource Recovery Center. The construction debris that can be reused will not be sent to the landfill and will be recycled or reused on other projects. Materials that cannot be recycled or reused will be sent to the Redwood Landfill and Recycling Center.

Redwood Landfill accepts construction and demolition debris, including concrete, and has a remaining capacity of 26 million cubic yards, which is more than adequate to meet the project's needs (CalRecycle, 2020); therefore, the project would have a less-than-significant impact on solid waste facilities.

Operation and Maintenance

Project operation and maintenance would include sediment removal and vegetation management. Sediment would continue to be removed from portions of the Corte Madera Creek channel including, the new fish pools. The project is designed to restore natural stream processes and would not cause increased sediment removal (see Section 3.9 for further detail). Vegetation and trash removed during routine maintenance would be similar to exiting vegetation and trash removal from Corte Madera Creek. The maintenance activities would

generally be the same as existing conditions (removal of sediment from fish pools) except for in Frederick Allen Park and lower Unit 2 where native vegetation and landscaping would be installed. The native vegetation and landscaping would not be a substantial source of waste that would be sent to a landfill and would not generate increased volume of debris. Materials removed from the site would be composted or beneficially reused to the extent feasible. The impact on landfill capacity would be less than significant.

Mitigation: None required.

	Significance Determination
Impact 3.15-5: The project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

Construction, Operation, and Maintenance

As discussed in Section 3.15.3, the California Integrated Waste Management Act of 1989 requires municipalities to divert at least 50 percent of all solid waste generated by the year 2000 and establishes the goal of diverting at least 75 percent of generated waste (based on per capita disposal rates) by 2020. In addition, Zero Waste Marin ensures Marin County's compliance with state recycling mandates and provides residents and businesses with information on household hazardous waste collection, recycling, composting, and waste disposal (Zero Waste Marin, 2020b). Once the project is operational, it would generate no measurable volume of solid waste above the amounts that are already removed from creek channels as part of routine maintenance. Trash and debris removed during routine channel maintenance would be sent to permitted landfills for disposal (Marin County Flood Control and Water Conservation District, 2018). This disposal would not result in an inconsistency with or violation of permit conditions at these facilities because the facilities are permitted and have adequate capacity to accept these non-hazardous wastes.

Recycling construction and demolition debris helps local jurisdictions meet state and local waste-diversion goals. As discussed in Impact 3.8-2 in Section 3.8 Hazards and Hazardous Materials, all waste would be transported and disposed of in accordance with all applicable federal, state, and location laws regarding soil and hazardous waste disposal. The project's construction and operation would be subject to applicable statutes and regulations related to solid waste. In addition, all landfills identified by the District for disposal and recycling of construction and demolition debris are permitted for the types of waste generated by project construction and operation and are required to meet federal, state, and local solid waste regulations. The project would comply with applicable federal, state, and local solid waste regulations; therefore, the impact would be less than significant.

Mitigation: None required.

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3.16 Agriculture and Forestry Resources, Mineral Resources, Land Use and Planning, Population and Housing, Wildfire, and Socioeconomics

3.16.1 Introduction

This section presents the environmental setting and impact analysis for agriculture and forestry resources, mineral resources, land use and planning, population and housing, and wildfire in the project area. Included in this section is a description of existing conditions as well as an evaluation of the potential effects on agriculture and forestry resources, mineral resources, land use and planning, population and housing, wildfire, and socioeconomics from implementation of the project.

3.16.2 Environmental Setting

Agricultural Resources

In Marin County, farms and ranches account for approximately 50 percent of the land, or 167,000 acres, with dairies and livestock ranches dominating (University of California Cooperative Extension, 2011). However, within the Town of Ross and unincorporated Kentfield, there are no zoned agricultural lands (MarinMap, 2020). The project involves improvements to Corte Madera Creek, which is located in an urban area of Marin County. The California Department of Conservation's Farmland Mapping and Monitoring Program designates the project area as Urban and Built-Up Land. These areas are defined as "…land [that] is occupied by structures with a building density of at least 1 unit to 1.5 acres… Common examples include residential, industrial, commercial, institutional facilities, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, and water control structures." No portion of the project area is under a Williamson Act contract (DOC, 2020).

Forestry Resources

Marin County, including Ross Valley, is widely known for its diverse natural beauty, including forested landscapes. While there is no timber production within Ross Valley, there is a mixture of forested vegetation that provides aesthetic, recreational, and environmental benefits. The project area is not zoned for forest land or timberland uses. No national or state forest lands are mapped in the watershed. Frederick Allen Park contains over 100 trees that provide a dense tree canopy. While Frederick Allen Park contains trees, the area is a public park and has been landscaped as a park. The trees within Frederick Allen Park are not subject to commercial harvesting or other forest uses. No commercial harvesting of forestry resources occurs within Frederick Allen Park or any portion of the project area.

Mineral Resources

Eight sites within Marin County are designated by the State as having significant mineral resources, and four additional sites are Marin County permitted resource sites (Marin County Community Development Agency , 2007). Based on review of Map 3-5, Location of Mineral Resource Preservation Sites, from the 2007 Marin Countywide Plan, there are no State of California Designated Mineral Resources Sites or Marin County Permitted Mineral Resource Sites in the project area. Further, the project area is mapped by the California Department of Conservation Division of Mines and Geology as Mineral Resource Zone 1 (MRZ-1), indicating that substantial mineral resources do not occur within these areas (DOC, 2020f).

Land Use and Planning

The Town of Ross is the second smallest of Marin's communities, with 1.6 square miles and slightly more than 800 residential parcels (Town of Ross, 2007). Unincorporated Kentfield has a population of approximately 11,854 and totals 3 square miles (Statistical Atlas, 2020).

The project is located in a developed suburban residential and commercial area. On-site land uses consist of the Corte Madera Creek bed, trails and bike paths, public parks and open space, residential uses, and schools and colleges. Frederick Allen Park is a linear park owned and maintained by the Town of Ross and located just south of the Post Office on Ross Common Road. The park is adjacent to Bike Route 20, a bicycle route that runs from the Larkspur Ferry Terminal to Fairfax.

A variety of land uses occur adjacent to Corte Madera Creek. Within Unit 4, adjacent land uses include residential housing (predominantly single-family), parking facilities, a bicycle -pedestrian pathway, Station Park, and Ross Common Park. Ross Town Hall and Ross Valley Fire Department (RVFD) Station 18 abut the creek on the left bank north of Lagunitas Road Bridge. Land uses adjacent to Unit 3 support a mix of residential, commercial, and public uses. Residential uses occur on both sides of the creek to Kentfield Hospital. Downstream of Kentfield Hospital, the concrete channel is bordered by residential uses to the College of Marin. South of College Avenue, the land uses adjacent to the concrete channel include a mix of commercial uses, residential use, Kent Middle School, and College of Marin recreational fields. The land uses and zoning designations adjacent to the project area are described by Unit in Table 3.16-1.

Population and Housing

Regional Setting

In 2020, Marin County's population was approximately 260,831. Marin County's growth rate is projected to decline, and the Town of Ross's growth rate is projected to increase, as shown in Table 3.16-2. Marin County had approximately 112,516 households, with an average of 2.40 persons per household, as shown in Table 3.16-3 (Department of Finance, 2020a). If both vacant and underdeveloped lots were developed, approximately 15,200 new housing units, including both single-family and multi-family, could be added countywide (Marin County Community Development Agency, 2007).

Table 3.16-1 General Plan Land Use Designations and Zoning in Project Vicinity

Unit	Element	Jurisdiction	Zoning	General Plan Land Use Designation
Unit 4	Fish ladder removal and Unit 4 grading	Town of Ross	Single Family Residential, Public and Quasi Public[a]	Public Service, Public Park and Open Space, Low-Density Residential, Medium-Low-Density Residential
Unit 3	Frederick Allen Park	Town of Ross	Single Family Residential, Public and Quasi Public, Flood Control Area	Medium-Low-Density Residential, Multi-Family Residential, Public Park and Open Space
	Fish pools	Town of Ross	Single Family Residential, Public and Quasi Public, Flood Control Area, Public Facilities	Single Family Residential, Public Facilities, Public Park and Open Space
	Floodwall (segment #3)	Town of Ross and Unincorporated Kentfield	Single Family Residential, Public and Quasi Public, Flood Control Area, Public Facilities	Park and Open Space, Medium Low Density Residential
	Stormwater pump station	Unincorporated Kentfield	Single Family Residential, Public Facilities	Public Facilities, Tax Exempt
	Floodwall (segment #2)		Residential Commercial Multiple Planned	Public Facility, Single Family Residential
Unit 2	Floodwall (segment #1)	Unincorporated Kentfield	Public Facilities; Residential Two Family	Neighborhood Commercial Mixed Use
	Lower College of Marin Concrete Channel Removal	Unincorporated Kentfield	Public Facilities; Residential Two Family	Neighborhood Commercial Mixed Use, Public Facility, Multifamily Residential
N/A	Staging areas	Town of Ross and Unincorporated Kentfield	Single Family Residential, Public and Quasi Public, Flood Control, Public Facilities, Residential Commercial Multiple Planned	Tax Exempt, Public Facility, Public Park and Open Space, Residential

Note

[a] Quasi public category is established for land owned by a non-governmental agency that is used as an institution serving the public.

Table 3.16-2 Population and Growth Rates of Marin County and Town of Ross

Region	Population				Growth Rates (%)		
	2010	2015	2020	2050 (Projected)	2010-2015	2015-2020	2020-2050 (Projected)
Marin County	252,409	262,743	260,831	247,437	+4.09	-0.72	-5.13
Town of Ross	2,415	2,544	2,550		+5.34	+0.24	

Source: (Department of Finance, 2020a; Department of Finance, 2020b)

Table 3.16-3 Marin County Housing Demographics

Information Category	1980 Actual	1990 Actual	2000 Actual	2010 Actual	2020 Actual	Theoretical Buildout
Households	88,723	95,006	100,650	103,210	112,516	118,728
Average household size	2.43	2.33	2.34	2.36	2.40	2.36

Note: The Countywide Plan does not include projections that estimate the time by which a certain level of development is projected to occur. Instead, tables of statistics are presented for the County and for each of the seven planning areas; these tables identify four benchmarks by which to measure trends: U.S. Census Bureau counts of population, households, employed residents, and jobs for the years 1980, 1990, and 2000. They also include a projection of development that could occur if land vacant and underutilized in 2004 were fully developed pursuant to the zoning designations of city and County general plans.

Sources: (Marin County Community Development Agency, 2007; US Census Bureau, 1980; US Census Bureau, 1990; Bay Area Census, 2020).

Town of Ross

The Town of Ross is the second smallest of Marin's communities, with 1.6 square miles and slightly more than 800 residential parcels. Between 1990 and 2005, the population grew by 214 people, which is about the same rate of growth as Marin County as a whole. In 2020, the Town of Ross's population was approximately 2,550 (Department of Finance, 2020a). There were 2,498 households, with an average of 3.02 persons per household.

Kentfield

Unincorporated Kentfield within Marin County had a population of approximately 6,485 in 2010 (US Census Bureau, 2019). There were approximately 2,630 households from 2014 to 2018, and 2.62 persons per household.

Wildfire

Wildfire is common in many places around the world, including many of the forested areas of the United States, where the climates are sufficiently moist to allow the growth of trees but feature extended dry, hot periods when fallen branches, leaves, and other material can dry out and become highly flammable (USACE, 2018).

The Town of Ross and unincorporated Kentfield are all listed as wildland–urban interface communities but are not within the very high fire hazard severity zone(FIRESafe MARIN, 2020; CAL FIRE, 2008). A State Responsibility Area (SRA) is immediately adjacent to the project area (Marin County, 2020). Refer to Section 3.8 Hazards and Hazardous Materials for more information on wildfire hazards.

Socioeconomics

The three largest ethnic groups in Marin County are White (Non-Hispanic), White (Hispanic), and Asian (Non-Hispanic). Marin County has a population of 260,831 people in 2020, with median age of 47.4 and median household income of $126,373 (DataUSA, 2018). Approximately eight percent of the population lives below the poverty line in Marin County, which is lower than the national average of 13.1 percent (DataUSA, 2018).

The largest industries in Marin County are professional, scientific and technical services, health care and social assistance, and retail trade. The highest-paying industries are finance and insurance, professional, scientific and technical services, and information (DataUSA, 2018). From 2017 to 2018, employment in Marin County grew at a rate of 5.32 percent. The most common job groups are management occupation, sales and related occupations, and business and financial operations occupations (DataUSA, 2018).

3.16.3 Regulatory Setting

The following laws, statutes, regulations, codes, and policies would apply to the project.

State Regulations

Farmland Mapping and Monitoring Program

The Department of Conservation established the Farmland Mapping and Monitoring Program to help assess the location, quantity, and quality of agricultural lands and the conversion of these lands to nonagricultural uses (DOC, 2020). The Farmland Mapping and Monitoring Program uses Natural Resources Conservation Service soil classifications, land inventories, and monitoring criteria to prepare digitized maps of farmland in California. These maps and associated statistics are updated every two years and are used in general plans, regional studies of agricultural land conversion, and in assessing project impacts on farmland.

California Land Conservation Act (Williamson Act)

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, is a nonmandated state program administered by counties and cities to preserve agricultural land and discourage the premature conversion of agricultural land to urban uses. The act authorizes local governments and property owners to (voluntarily) enter into contracts to commit agricultural land to specified uses for 10 or more years. Once restricted, the land is valued for taxation based on its agricultural income rather than unrestricted market value, resulting in a lower tax rate for owners. In return, the owners guarantee that these properties remain under agricultural production for an initial 10-year period. The contract is renewed automatically unless the owner files a notice of nonrenewal, thereby sustaining contiguous 10-year contracts.

Participation is on a voluntary basis by both landowners and local governments and is implemented through the establishment of agricultural preserves and the execution of Williamson Act contracts.

California Public Resources Code

Section 4526

This section defines "timberland" as land, other than land owned by the federal government and land designated by the board as experimental forest land, that is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species shall be determined by the board on a district basis.

California Government Code

Section 51104(g)

This section defines a "timberland production zone" or "TPZ" as an area that has been zoned pursuant to Section 51112 or 51113 and is devoted to and used for growing and harvesting timber or for growing and harvesting timber and compatible uses, as defined in subdivision (h).

Government Code

Section 65300

State law (Government Code, Section 65300) requires that each county and city, including charter cities, prepare and adopt a comprehensive, long-term general plan for future development. This general plan must contain the following seven elements: (1) land use; (2) circulation; (3) housing; (4) conservation; (5) open space; (6) noise; and (7) safety (Government Code, Section 65302). Of these, state law mandates that the land-use element must correlate with the circulation element. In addition to these, state law permits cities and counties to include optional elements in their general plans, thereby providing local governments with the flexibility to address the specific needs and unique character of their jurisdictions. California law also requires that the day-to-day decisions of a city or county follow logically from and be consistent with the general plan. More specifically, Government Code Sections 65860, 66473.5, and 66474, require that zoning ordinances and subdivision and parcel map approvals be consistent with the general plan. Goals, objectives, and programs established for each element of the general plan must meet the existing and future needs and desires of the community. These goals, objectives, and programs are specific, action-oriented, and promoted during the life of the general plan and are applicable to the goals and objectives of the project.

Section 65402(b)

State law (Government Code Section 65402[b]) requires the District to notify cities of its plans to construct projects or acquire extraterritorial property within the city's jurisdiction. Cities then have 40 days to determine project consistency with their general plans. These consistency determinations are advisory to the District rather than binding.

Building and zoning ordinances represent the most specific expressions of general plan goals, objectives, and policies. State law and judicial interpretation of state law (California Government Code, Section 53091 et seq.) mutually exempt cities and counties from complying with each other's building and zoning ordinances.

Defensible Space for Fire Protection

State of California regulations regarding defensible space requirements are contained in section 4291 of the Public Resources Code (PRC) and Section 51182 of the California Government Code. The PRC primarily directs the creation of defensible space in State Responsibility Areas, while the California Government Code sets the fuel-treatment requirements in local responsibility areas that are designated as very high hazard severity zones. Both codes generally include a requirement to maintain defensible space of 100 feet from each side and from the front and rear of structures but not beyond the property line except under specific circumstances, which would be applicable to the project.

State Board of Forestry and Fire Protection – 2018 Strategic Fire Plan

The Board of Forestry and Fire Protection (Board) developed and adopted the Strategic Fire Plan pursuant to the direction provided under Public Resources Codes Sections 4114 and 4130 regarding fire protection plan development. The Board has adopted these Plans since the 1930s and periodically updates them to reflect current and anticipated needs. The 2018 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. Additionally, the continued inclusive collaboration among local, state, federal, tribal, and private partners remain paramount to effectively manage towards a more fire-resilient wildland–urban interface and natural environment. Through government and community collaboration, the following goals are intended to enhance the protection of lives, property, and natural resources from wildland fire as well as to improve environmental resilience to wildland fire, all of which would apply to this project:

1. Identify and evaluate wildland-fire hazards and recognize life, property, and natural resource assets at risk, including watershed, habitat, social, and other values of functioning ecosystems. Facilitate the collaborative development and sharing of all analyses and data collection across all ownerships for consistency in type and kind.
2. Promote and support local land-use planning processes as they relate to: (a) protection of life, property, and natural resources from risks associated with wildland fire and (b) individual-landowner objectives and responsibilities.
3. Support and participate in the collaborative development and implementation of local, county, and regional plans that address fire protection and landowner objectives.

4. Increase fire-prevention awareness, knowledge, and actions implemented by individuals and communities to reduce human loss, property damage, and impacts to natural resources from wildland fires.
5. Integrate fire and fuels management practices with landowner/land manager priorities across jurisdictions.
6. Determine the level of resources necessary to effectively identify, plan, and implement fire prevention using adaptive management strategies.
7. Determine the level of fire suppression resources necessary to protect the values and assets at risk identified during planning processes.
8. Implement post-fire assessments and programs for the protection of life, property, and natural-resource recovery.

Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act of 1975 was enacted to encourage the production, conservation, and protection of California's mineral resources (DOC, 2019). Together, the DOC's Office of Mine Reclamation and the State Mining and Geology Board oversee administration of the Act's requirements. The State Mining and Geology Board designates areas of statewide or regional significance. As described above, eight sites in Marin County have been designated as having significant mineral resources.

Regional and Local Regulations

Plan Bay Area – Association of Bay Area Governments

Plan Bay Area is a long-range integrated transportation and land-use/housing strategy through 2040 for the San Francisco Bay Area. On July 26, 2017, the plan was jointly approved by the Association of Bay Area Governments Executive Board and by the Metropolitan Transportation Commission. The plan includes the region's Sustainable Communities Strategy and the 2040 Regional Transportation Plan and represents the next iteration of a planning process that has been in place for decades. Plan Bay Area marks the nine-county region's first long-range plan to meet the requirements of California's landmark 2008 Senate Bill 375, which calls on each of the state's 18 metropolitan areas to develop a Sustainable Communities Strategy to accommodate future population growth and reduce greenhouse gas emissions from cars and light trucks. Developed in collaboration with cities and counties, the plan advances initiatives to expand housing and transportation choices, create healthier communities, and build a stronger regional economy (MTC and ABAG, 2019).

Marin Countywide Plan

The following goals and policies related to agriculture and forestry resources, mineral resources, land use and planning, population and housing, wildfire, and socioeconomics in the Marin Countywide Plan are relevant to the project (Marin County, 2007).

Forestry

Goal DES-1.3: Encourage Sustainable Urban Forestry. Promote the use of sustainable urban forestry practices that address long-term forest management, public education, and outreach.

Community Development

Goal CD-2: Balanced Communities. Maintain balanced communities that house and employ persons from all income groups and provide the full range of needed facilities and services.

> ***Policy CD-2.8: Limit Development in Resource or Hazard Areas.*** Discourage development in areas with high natural resource value or threats to life or property, and restrict development in such areas to minimize adverse impacts.

Goal CD-4: Coordinate Planning with Other Jurisdictions. Coordinate implementation of the Countywide Plan with community plans and planning efforts by local cities, towns, and special districts, and adjacent counties, as well as regional, State, and federal agencies.

> ***Policy CD-4.4: Provide a Forum to Monitor Issues of Concern.*** Provide periodic forums with the cities and towns, other local agencies, and members of the public to engage in discussions on issues of mutual concern, such as more-efficient delivery of services, and to promote the sharing of ideas, information, resources, and best practices for Marin.

Goal CD-2: Balanced Communities. Maintain balanced communities that house and employ persons from all income groups and provide the full range of needed facilities and services.

> ***Policy CD-2.8: Limit Development in Resource or Hazard Areas.*** Discourage development in areas with high natural resource value or threats to life or property, and restrict development in such areas to minimize adverse impacts.

Socioeconomics

Goal EC-1: A Vibrant Economy. Establish and Maintain a diverse and sustainable local economy.

> ***Policy EC-1.5: Consider the Impacts of Climate Change.*** Identify strategies to protect the economy from the impacts of seal level rise, natural disasters, and diseases outbreaks.
>
> > *Implementing Programs EC-1.o*: *Incorporate Economic Impacts of Climate Change into Planning.* Consider integrating economic disaster planning into disaster preparedness and mitigation plans, and analyze impacts to the economy from climate change.

Marin County Native Tree Preservation Ordinance

Marin County adopted the Native Tree Preservation and Protection Ordinance (Ordinance No. 3341) in 2002. This ordinance provides for the preservation and protection of native trees in unincorporated portions of Marin County through limiting the removal of protected trees and requiring replacement plantings for trees that are removed.

Town of Ross Municipal Code

The following codes of the Town of Ross Municipal Code related to agriculture and forestry resources, mineral resources, land use and planning, population and housing, wildfire, and socioeconomics are applicable to the project (Town of Ross, 2020).

Chapter 12.24 Planting, Alteration, Removal, or Maintenance of Trees

> **12.24.080 Tree Alteration or Removal Permits and Appeals.** The Public Works Director shall review and approve, conditionally approve, or deny a Tree Alteration or Removal Permit application if no other entitlements are required. The Public Works Director shall give written notice to the applicant of his or her decision on the application within 30 days. The Public Works Director may refer an application directly to the Town Council for consideration. If native species are removed, replacement trees shall be of a species native to those lands that now constitute the Town of Ross, or a non-native species approved by town staff based on specific site circumstances. Replacement trees should have the same mature size as the trees that have been removed, unless town staff recommends otherwise based on specific site circumstances. If there is a conflict between arborists regarding the condition or structure of a tree, the town arborist's decision shall control. The Town Council or Public Works Director may reduce the number of replacement trees or the tree replacement ratio, as applicable, if the reduction will not negatively impact the environmental functions and value of the urban forest or the aesthetic values of the community. The applicant shall complete tree replacement within sixty (60) days of tree removal, unless the Town has approved a longer time. Failure to plant required tree replacement may subject the property owner to Administrative Penalties under Chapter 9.70 until the replacement trees are planted.

Chapter 14.04 California Fire Code

Wildland–Urban Interface Fire Area. A geographical area identified by the Town of Ross as a "Fire Hazard Severity Zone" in accordance with the Public Resources Code, Sections 4201 through 4204, and California Government Code, Sections 51175 through 51189, or other areas designated by the enforcing agency to be at a significant risk from wildfires, as designated on the map titled Town of Ross Wildland–Urban Interface, dated August 12, 2018, or any map or future map that is adopted to supersede the current map.

Chapter 15.05 California Building Code

Wildland-Urban Interface Fire Area is a geographical area identified by the state as a "Fire Hazard Severity Zone" in accordance with Public Resources Code Sections 4201 through 4204 and California Government Code, Sections 51175 through 51189, or other areas designated by the enforcing agency to be at a significant risk from wildfires. Within the Town of Ross, the Wildland–Urban Interface Fire Area shall include the areas shown on the Wildland–Urban Interface Map adopted by the Town Council and on file with the Town Clerk.

Town of Ross General Plan
The following policy of the Ross General Plan related to mineral resources, land use and planning, population and housing, wildfire, and socioeconomics is applicable to the project (Town of Ross, 2007).

Housing Element
Housing Goal - Protect and Enhance Existing Housing, Community Character, and Resources. Maintain the high quality of existing housing and community character, and assure energy efficiency in new and existing housing.

Kentfield/Greenbrae Community Plan
The following goal of the Kentfield/Greenbrae Community Plan related to mineral resources, land use and planning, population and housing, wildfire, and socioeconomics is applicable to the project (Kentfield Greenbrae Planning Group and Marin County Planning Department, 1987).

Goal 10: To the greatest extent possible, preserve the natural beauty and view corridors of the planning area. Protect and enhance environmental resources in accordance with policies of the Countywide Plan.

3.16.4 Impact Assessment Methodology

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist) and Marin County Environmental Review Guidelines the project could have a significant impact if it would:

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract;
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220[g]), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104[g]);
d. Result in the loss of forest land or conversion of forest land to non-forest use; or
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.
f. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state;

g. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan;
h. Physically divide an established community;
i. 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;
j. Result in substantial alteration of the character or functioning of the community, or present planned use of an area;
k. Conflict with applicable Countywide Plan designation or zoning standards;
l. Induce substantial unplanned population growth in an area, either directly or indirectly; or
m. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.
n. Increase density that would exceed official population projections for the planning area within which the project site is located as set forth in the Countywide Plan and/or community plan;
o. Displace existing housing, especially affordable housing; or
Result in physical changes which can be traced through a chain of cause and effect to social or economic impacts.

If located in or near State Responsibility Areas or lands classified as very high fire hazard severity zones, the project could have significant impact if it would:

p. Substantially impair an adopted emergency response plan or emergency evacuation plan;
q. 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;
r. 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; or
s. 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.
Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

Approach to Impact Analysis

The following analysis discusses the potential significant impacts of the project related to land use and planning, population and housing, and wildfire impacts in the project area. This section includes an analysis of potential short-term (construction) and long-term (operation and

maintenance) impacts of the project. Impact evaluations are assessed based on the existing conditions described above. Mitigation measures are identified, as necessary, to reduce significant impacts. The analysis considers the project, Appendix G of the CEQA Guidelines, existing conditions, and applicable regulations, plans, and policies.

3.16.5 Impact Discussion

Impacts Avoided

Due to the nature of the project, there would be no impacts related to the following criteria; therefore, no impact discussion is provided for the reasons described below:

1. Criterion **(a):** The project area is designated as Urban and Built-Up Land, and there is no land containing Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Therefore, implementation of the project would not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use, nor would it impair the productivity of prime agricultural land. There would be no impact.
2. **Criterion (b):** Implementation of the project would not conflict with existing zoning for agricultural land or a Williamson Act contract because none of the project area is zoned for agricultural use or includes lands under a Williamson Act contract. No other agricultural resources, operations, or contracts exist. There would be no impact.
3. **Criterion (c):** The project would not conflict with zoning for forestry resources because the project area is not zoned as forest land, timberland, or Timberland Production by the County or Town of Ross.
4. **Criterion (d):** The project would not result in loss of forestland or conversion of forestland to non-forest use because no forestland occurs within the project area. The trees located within the area are part of the urban landscape and do not constitute forestland.
5. **Criterion (e):** The project would not result in any other changes in the existing environment that could result in the conversion of Farmland to non-agricultural use because the project is not located within designated Farmland. The project would not result in any other changes in the environment that would convert forestland to non-forest uses because the flood-risk management project is compatible with forest uses outside of the project area.
6. **Criterion (f)** The project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state because the project area does not contain any known mineral resource sites.
7. **Criterion (g):** The project would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land-use plan because the project area does not contain any locally important mineral resource recovery sites.

8. **Criterion (k):** The project would not displace any housing and therefore would not necessitate construction of replacement housing. There would be no impact during construction or operation of the project.
9. **Criteria (q) (r) (s) (t) (u):** The project area is not located in or near a state responsibility area or a very high fire hazard severity zone. The criteria are therefore not applicable to the project. Further, the project lies upon relatively flat ground and within and adjacent to a creek. The project would not expose people to pollutant concentrations from wildfire or the uncontrolled spread of a wildfire and there would be no impact.
10. **Criterion (o):** The project would not displace existing housing or affordable housing. There would be no impact.
11. **Criterion (p):** The project would reduce flood risk and create habitat. The project would not cause other physical changes in the environment that are tied to social or economic impacts. There would be no impact.

Impacts Analyzed

	Significance Determination
Impact 3.16-1: The project would not physically divide an established community.	**Construction: Less than Significant**
	Operation and Maintenance: No Impact

Overview

Physical division of an established community would typically involve construction of a physical barrier to neighborhood access, such as a new freeway or removal of a means of access, such as a bridge or a roadway, which would not occur under the project. The creek corridor is a physical barrier between neighbors. Paths along the creek provide pedestrians and bicyclists connections through this corridor and impacts to those pathways could be construed as dividing an established community.

Construction

Construction of the project would involve the temporary closure of Frederick Allen Park and the bicycle and pedestrian path through Frederick Allen Park for up to seven months. The project would also require temporary closure of informal walking paths on the left bank during installation of new floodwall segments in Units 2 and 3 as well as temporary closure of an informal levee path during construction of the lower College of Marin concrete channel removal. The informal paths would be closed for up to two months. The bikeway and path closures would be temporary, and access would be restored post construction. In addition, access would be available through the neighborhood and community on existing city streets, which would not be affected by construction; therefore, the project would not physically divide an established community, and impacts would be less than significant.

Operation and Maintenance

The multi-use path through Frederick Allen Park would be realigned, and access would remain through Frederick Allen Park through operation and maintenance of the project. The project would not have long-term impacts on other pathways through the area. No impact would occur.

Mitigation: None required.

Impact 3.16-2: The project would not 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.	Significance Determination
	Construction: No Impact
	Operation and Maintenance: No Impact

Conflicts with land-use plans, policies, and regulations do not necessarily indicate a significant environmental land-use impact under CEQA unless a project substantially conflicts with a land-use plan or policy that was adopted for the purpose of avoiding or mitigating an environmental effect such that a substantial adverse physical change in the environment related to land use would result. To the extent that physical-environmental impacts may result from such conflicts, the physical impacts are evaluated under the relevant environmental-topic environmental resource sections.

The project is consistent with the goals of Plan Bay Area, the project would reduce flood risk in existing neighborhoods as discussed further in Section 3.9 Hydrology, thereby building a stronger and more functional housing community. The project is subject to the land-use policies contained within the Marin Countywide Plan, Town of Ross General Plan, and Kentfield/Greenbrae Community Plan. Table 3.16-4 lists the relevant policies and provides a rationale and a preliminary determination as to whether the project would conflict with those policies. Whether the project is consistent with particular plans will be determined at the time of project approval by the agency charged with making that consistency determination. The project would not conflict with land-use policies that were adopted for the purpose of avoiding or mitigating an environmental effect. No impact would occur.

Mitigation: None required.

Table 3.16-4 Applicable Land Use Policies Adopted to Avoid or Mitigate an Environmental Effect

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	Marin Countywide Plan	
Goal AIR-1	**Improved Regional Air Quality.** Promote planning and programs that result in the reduction of airborne pollutants measured within the county and the Bay Area.	**Consistent.** Long-term operation of the project would not result in an increase in airborne pollutants within the County or the Bay Area. However, short-term particulate emissions would be generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment also are anticipated and would include carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compounds (VOCs), particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants such as diesel exhaust particulate matter. As discussed in Section 3.2, Impact 3.2-2, air quality emissions would not exceed any air quality standards set by BAAQMD. In addition, the project would implement the fugitive dust control best management practices consistent with BAAQMD requirements; therefore, the project is consistent with Goal AIR-1 and Policy AIR-1.2.
Policy AIR-1.2	**Meet Air Quality Standards.** Seek to attain or exceed the more stringent of federal or State Ambient Air Quality Standards for each measured pollutant.	
Policy AIR-1.3	**Require Mitigation of Air Quality Impacts.** Require projects that generate potentially significant levels of air pollutants, such as quarry, landfill operations, or large construction projects, to incorporate best available air quality mitigation in the project design.	**Consistent.** The project is consistent with this policy because the project would not generate a significant level of air pollutants as discussed in Section 3.2, Impact 3.2-2.
Implementing Program AIR-1.g	**Require control measures for construction and agricultural activity.** Require reasonable and feasible measures to control particulate emissions (PM-10 and PM-2.5) at construction sites and during agricultural tilling activity, pursuant to the	**Consistent.** Mitigation Measure 3.2-2 requires implementation of these BAAQMD's fugitive dust Basic Control Measures, which would meet BAAQMD CEQA Air Quality Guidelines requirements for fugitive dust emissions. The project is consistent with this implementing program.

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	recommendations in the BAAQMD CEQA Guidelines, which may include the following: • Watering active construction or agricultural tilling areas. • Covering hauled materials. • Paving or watering vehicle access roads. • Sweeping paved and staging areas	
Goal AIR-4	**Minimization of Contributions to Greenhouse Gases**. Prepare policies that promote efficient management and use of resources in order to minimize greenhouse gas emissions. Incorporate sea level rise and more extreme weather information into the planning process.	**Consistent.** Sea level rise was incorporated into the hydrology modeling analysis of the project as discussed in Section 3.9. The project is consistent with this goal.
Implementing Program AIR-4.c	**Reduce Methane Emissions Released from Waste Disposal.** Encourage recycling, decrease waste sent to landfills, require landfill methane recovery, and promote methane recovery for energy production from other sources. (See Goal PFS-3.)	**Consistent.** The project's demolition debris and soil, including concrete, would be recycled at the Marin Resource Recovery Center. Construction materials would be disposed of appropriately to meet recycling requirements. The project is consistent with this implementing program.
Goal BIO-1	**Enhanced Native Habitat and Biodiversity.** Effectively manage and enhance native habitat, maintain viable native plant and animal populations, and provide for improved biodiversity throughout the County.	**Consistent.** As documented in Section 3.3, background research and reports have been completed to identify sensitive biological resources in the project area, including wetlands, special-status plants and wildlife, sensitive natural communities, and native trees. Analyses have been conducted to determine the potential for project impacts on these resources and appropriate mitigation measures to minimize the potential for significant impacts. The project is consistent with this goal.
Policy BIO-1.1	**Protect Wetlands, Habitat for Special-Status Species, Sensitive Natural Communities, and Important Wildlife**	**Consistent.** Section 3.3 describes the biological resources in the project area, evaluates the project's potential impacts on

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	Nursery Areas and Movement Corridors. Protect sensitive biological resources, wetlands, migratory species of the Pacific flyway, and wildlife movement corridors through careful environmental review of proposed development applications, including consideration of cumulative impacts, participation in comprehensive habitat management programs with other local agencies and resource management agencies, and continued acquisition and management of open space lands that provide for permanent protection of important natural habitats.	those responses, and identifies appropriate mitigation measures to minimize those impacts. Implementation of the mitigation measures identified in Section 3.3 would protect sensitive biological resources, wetlands, migratory species, and wildlife movement corridors. Therefore, the project would be consistent with this policy.
Policy BIO-1.3	**Protect Woodlands, Forests, and Tree Resources**. Protect large native trees, trees with historical importance; oak woodlands; healthy and safe eucalyptus groves that support colonies of monarch butterflies, colonial nesting birds, or known raptor sites; and forest habitats. Prevent the untimely removal of trees through implementation of standards in the Development Code and the Native Tree Preservation and Protection Ordinance. Encourage other local agencies to adopt tree preservation ordinances to protect native trees and woodlands, regardless of whether they are located in urban or undeveloped areas	**Consistent.** As discussed in Chapter 2 Project Description and Section 3.3, implementing the project would involve removal of 369 trees. In addition, construction activities could indirectly affect native trees by damaging roots, compacting soils, and altering drainage patterns. Mitigation Measure 3.3-2b requires mitigation for tree removal in accordance with this policy and the Native Tree Preservation and Protection Ordinance ; therefore, the project would be consistent with this policy.
Policy BIO-1.6	**Control Spread of Invasive Exotic Plants**. Prohibit use of invasive species in required landscaping as part of the discretionary review of proposed development. Work with landowners, landscapers, the Marin County Open Space District, nurseries, and the multi-agency Weed Management Area to remove and prevent the spread of highly invasive and noxious weeds. Invasive plants are those plants listed in the State's Noxious Weed List, the California Invasive Plant Council's list of Exotic Pest Plants of Greatest Ecological Concern in California, and other priority species identified by	**Consistent.** As discussed in Section 3.3, project construction could introduce invasive species to the project area through weeds on construction equipment or worker boots/waders. Mitigation measures identified in Section 3.3 would require washing of vehicles, cleaning equipment, and defining specific requirements to ensure construction equipment and materials are free of invasive species. Implementing these mitigation measures would prevent introduction of invasive plant species to the project area. Therefore, the project would be consistent with the County's efforts to control spread of invasive plants.

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	the agricultural commissioner and California Department of Agriculture.	
Policy BIO-2.3	**Preserve Ecotones.** Condition or modify development permits to ensure that ecotones, or natural transitions between habitat types, are preserved and enhanced because of their importance to wildlife. Ecotones of particular concern include those along the margins of riparian corridors, baylands and marshlands, vernal pools, and woodlands and forests where they transition to grasslands and other habitat types.	**Consistent.** As discussed in Section 3.3, implementation of the project would temporarily impact 0.55 acre of riparian habitat and remove oak trees. The project would result in a net increase in riparian and wetland habitat. Mitigation measure identified in Section 3.3 would ensure successful restoration of riparian areas and replacement of oak woodland habitat. With implementation of mitigation measures, the project would be consistent with this policy.
Policy BIO-2.4	**Protect Wildlife Nursery Areas and Movement Corridors.** Ensure that important corridors for wildlife movement and dispersal are protected as a condition of discretionary permits, including consideration of cumulative impacts. Features of particular importance to wildlife for movement may include riparian corridors, shorelines of the coast and bay, and ridgelines. Linkages and corridors shall be provided that connect sensitive habitat areas such as woodlands, forests, wetlands, and essential habitat for special-status species, including an assessment of cumulative impacts.	**Consistent.** As discussed in Section 3.3, implementation of the project would remove trees that could provide nesting sites for migratory birds or raptors. The District would implement mitigation measures to define avoidance buffers for tree removal to avoid disruption of bird nesting activities and ensure successful restoration of riparian areas to offset impacts from tree removal. The project would also implement mitigation for tree replacement. Project impacts to nesting habitats would be less than significant with mitigation. Therefore, the project would be consistent with the County's efforts to protect wildlife nursery areas and movement corridors.
Policy BIO-2.5	**Restrict Disturbance in Sensitive Habitat During Nesting Season.** Limit construction and other sources of potential disturbance in sensitive riparian corridors, wetlands, and baylands to protect bird nesting activities. Disturbance should generally be set back from sensitive habitat during the nesting season from March 1 through August 1 to protect bird nesting, rearing, and fledging activities. Preconstruction surveys should	**Consistent.** Mitigation Measures 3.3-1d and 3.3-2b define procedures to avoid nesting bird impacts consistent with this policy. With the implementation of these mitigation measures, the project would be consistent with County policy to minimize disturbance to sensitive habitat during the nesting season.

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	be conducted by a qualified professional when development is proposed in sensitive habitat areas during the nesting season, and appropriate restrictions should be defined to protect nests in active use and ensure that any young have fledged before construction proceeds.	
Policy BIO-2.8	**Coordinate with Trustee Agencies.** Consult with trustee agencies (the CDFW, USFWS, NOAA Fisheries, USACE, USEPA, RWCQB, and BCDC) during environmental review when special-status species, sensitive natural communities, or wetlands may be adversely affected. Goal BIO-3: Wetland Conservation. Require all feasible measures to avoid and minimize potential adverse impacts on existing wetlands and to encourage programs for restoration and enhancement of degraded wetlands.	**Consistent.** Prior to preparation of the EIR all trustee agencies received a Notice of Preparation and were asked to submit comments on environmental concerns. As discussed in Section 3.3, the appropriate permits and approvals would be obtained from responsible agencies, including CDFW, RWQCB, NMFS, and USACE. The project is consistent with this policy.
Goal BIO-4	**Riparian Conservation.** Protect and, where possible, restore the natural structure and function of riparian systems.	**Consistent.** The project would result in a net creation of riparian habitat within new floodplain areas. Therefore, the project is consistent with the County's riparian conservation policy.
Policy BIO-4.4	**Promote Natural Stream Channel Function**. Retain and, where possible, restore the hydraulic capacity and natural functions of stream channels in SCAs. Discourage alteration of the bed or banks of the stream, including filling, grading, excavating, and installation of storm drains and culverts. When feasible, replace impervious surfaces with pervious surfaces. Protect and enhance fish habitat, including through retention of large woody debris, except where removal is essential to protect against property damage or prevent safety hazards. In no case shall alterations that create barriers to fish migration be	**Consistent.** The proposed project is a flood risk management project that would include project elements to restore Corte Madera Creek within the project area to a more natural state, including replacing the concrete channel in Frederick Allen Park with a wider earthen channel and floodplain and removing the lower College of Marin concrete channel to restore natural creek function. The project would also involve project elements that enhance creek habitat. Habitat enhancement includes increasing the natural condition both in the channel and adjacent to the creek by removing concrete and structures that

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	allowed on streams mapped as historically supporting salmonids. Alteration of natural channels within SCAs for flood control should be designed and constructed in a manner that retains and protects the riparian vegetation, allows sufficient capacity and natural channel migration, and allows reestablishment of woody trees and shrubs without compromising the flood flow capacity where avoidance of existing riparian vegetation is not possible. (Details in setbacks and other aspects of stream corridors are in Section 2.4 of the Marin Countywide Plan.)	restrict flow, obstruct fish passage, or block natural vegetation establishment. Accordingly, the project is consistent with the County's policy to promote natural stream channel functions.
Policy BIO-4.5	**Restore and Stabilize Stream Channels**. Pursue stream restoration and appropriate channel redesign where sufficient right-of-way exists that includes the following: a hydraulic design, a channel plan form, a composite channel cross-section that incorporates low flow and bankfull channels, removal and control of invasive exotic plant species, and biotechnical bank stabilization methods to promote quick establishment of riparian trees and other native vegetation.	**Consistent.** The project has been designed to include stream restoration and appropriate channel design for portions of Corte Madera Creek within Unit 4, Frederick Allen Park and lower Corte Madera Creek. The project design in Frederick Allen Park incorporates low flow and bankfull channels and biotechnical bank stabilization methods using riparian trees and native vegetation. The project is consistent with this policy.
Policy BIO-4.6	**Control Exotic Vegetation**. Remove and replace invasive exotic plants with native plants as part of stream restoration projects and as a condition of site-specific development approval in a SCA, and include monitoring to prevent reestablishment.	**Consistent.** As described in Chapter 2 Project Description, maintenance activities of the project would include restoring creek habitat by removing invasive nonnative plants and revegetating with native plants. Therefore, the project is consistent with the County's efforts to control exotic vegetation.
Policy BIO-4.7	**Protect Riparian Vegetation.** Retain riparian vegetation for stabilization of streambanks and floodplains, moderating water temperatures, trapping and filtering sediments and other water pollutants, providing wildlife habitat, and aesthetic reasons.	**Consistent.** The project design includes net creation of riparian vegetation and habitat in Unit 4 and Frederick Allen Park. The project is consistent with this policy.

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
Policy BIO-4.8	**Reclaim Damaged Portions of SCAs.** Restore damaged portions of SCAs to their natural state wherever possible, and reestablish as quickly as possible any herbaceous and woody vegetation that must be removed within an SCA, replicating the structure and species composition of indigenous native riparian vegetation.	**Consistent.** The project would involve increasing natural conditions both in the channel and adjacent to the creek by removing concrete and structures that restrict flow, obstruct fish passage, or block natural vegetation establishment. The project would create conditions that promote fish habitat and passage and restore tidal, wetland, and riparian habitat along Corte Madera Creek. Therefore, the project would be consistent with the County's reclaim damaged portions of SCAs policy.
Policy BIO-4.9	**Restore Culverted Streams**. Replace storm drains and culverts in SCAs with natural drainage and flood control channels wherever feasible. Reopening and restoring culverted reaches of natural drainages should be considered part of review of development applications on parcels containing historic natural drainages where sufficient land area is available to accommodate both the reopened drainage and project objectives. Detailed hydrologic analysis may be required to address possible erosion and flooding implications of reopening the culverted reach, and to make appropriate design recommendations. Incentives should be provided to landowners in restoring culverted, channelized, or degraded stream segments. Where culverts interfere with fish migration but replacement is not possible, modify culverts to allow unobstructed fish passage.	**Consistent.** The project would remove the existing concrete storm drains in Unit 2. New vegetated bioretention basins and bio-swales would be constructed to handle stormwater run-off. The project would be consistent with the County's restore culverted streams policy.
Policy BIO-4.15	**Reduce Wet Weather Impacts**. Ensure that development work adjacent to and potentially affecting SCAs is not done during the wet weather or when water is flowing through streams, except for emergency repairs, and that disturbed soils are stabilized and replanted, and areas where woody vegetation	**Consistent.** The project has been scheduled to allow construction only during the dry season when creek flows are at their lowest. The project is consistent with this policy.

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	has been removed are replanted with suitable species before the beginning of the rainy season.	
Policy BIO-4.16	***Regulate Channel and Flow Alteration***. Allow alteration of stream channels or reduction in flow volumes only after completion of environmental review, commitment to appropriate mitigation measures, and issuance of appropriate permits by jurisdictional agencies based on determination of adequate flows necessary to protect fish habitats, water quality, riparian vegetation, natural dynamics of stream functions, groundwater recharge areas, and downstream users.	**Consistent.** Construction of the project would occur after completion of environmental review. The project is required to obtain permits and approval from various federal, state and local agencies. The anticipated permits and approvals needed for implementation of the project are identified in Section 2.8 Permits and Approvals. The District is committed to implementing mitigation measures identified in the EIR and requirements identified in appropriate permits. The project would be consistent with the County's regulate channel and flow alternation policy.
Policy BIO-4.19	**Maintain Channel Stability**. Applicants for development projects may be required to prepare a hydraulic and/or geomorphic assessment of onsite and downstream drainage ways that are affected by project area runoff. This assessment should be required where evidence that significant current or impending channel instability is present, such as documented channel bed incision, lateral erosion of banks (e.g., sloughing or landsliding), tree collapse due to streambank undermining and/or soil loss, or severe in-channel sedimentation, as determined by the County. (More details are available in Section 2.4 of the Marin Countywide Plan.)	**Consistent.** Hydraulic modeling and analysis were conducted for the project design and the model results are discussed in Section 3.9. The project is consistent with this policy.
Implementation Policy BIO-4.f	**Identify Potential Impacts to Riparian Systems.** At the time of a development application, evaluate potential impacts on riparian vegetation and aquatic habitat, and incorporate measures to protect riparian systems into the project design and construction. Retain and minimize disturbance to woody and	**Consistent.** Potential impacts to riparian vegetation and aquatic habitat and appropriate mitigation measures to reduce adverse impacts are discussed in Section 3.3. The project will result in a net increase in riparian vegetation due to increased planting of

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	herbaceous riparian vegetation in Stream Conservation Areas and adjacent areas. (Tree growth may be cleared from the stream channel where removal is essential to protect against property damage or prevent safety hazards.)	riparian vegetation in Unit 4 and Frederick Allen Park. The project is consistent with this policy.
Policy CD-2.8	**Limit Development in Resource or Hazard Areas.** Discourage development in areas with high natural resource value or threats to life or property and restrict development in such areas to minimize adverse impacts.	**Consistent.** The project will not introduce new development into the floodplain. The project would effectively provide enhanced levels of flood-risk reduction for existing developments adjacent to the creek. The project would be consistent with this policy.
Goal DES-4	**Protection of Scenic Resources.** Minimize visual impacts of development and preserve vistas of important natural features.	**Consistent.** As discussed in Section 3.1, the project would not have a substantial adverse effect on a scenic vista. The project would not block views of any scenic vista because the project features are located below grade or are low lying. The project includes landscaping and tree planting that is compatible with the natural environment and would create a natural riparian corridor and saltwater marsh areas along portions of Corte Madera Creek. The project would implement landscaping to screen new structures and would employ design features that are compatible with the existing visual context. The proposed floodwall elements in Units 2 and 3 would result in low contrast with the existing floodwall and would minimize visual impacts from the facilities due to the unity with the existing structure in the view. The project is consistent with the goal, policy and implementing programs.
Policy DES-4.1	**Preserve Visual Quality.** Protect scenic quality and views of the natural environment — including ridgelines and upland greenbelts, hillsides, water, and trees — from adverse impacts related to development	
Implementing Program DES-4.a	**Protect Key Public Views.** Work with community groups to identify, map, and protect important view corridors. Establish design standards for development in these areas as part of the design review requirements and individual community plans (see DES-3.b)	
Implementing Program DES-4.b	**Minimize Visual Impacts of Public Facilities.** Amend applicable codes and procedures to require appropriate placement, design, setbacks, and native landscaping of public facilities (including soundwalls, medians, retaining walls, power lines, and water tanks) to reduce visual impacts, and encourage local agencies to adopt similar standards.	

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
Goal EH-2	**Safety from Seismic and Geologic Hazards.** Protect people and property from risks associated with seismic activity and geologic conditions.	**Consistent.** Mitigation Measure 3.6-1 requires the preparation of a geotechnical investigation report by a professional geotechnical engineer to identity potential geologic hazards in the project area consistent with the implementing program. The mitigation measure also requires the report to meet performance criteria imposed by the California Building Code. The report would be incorporated into the design of the project structures to minimize seismic hazards and ensure structural safety of the proposed structures.
Policy EH-2.1	**Avoid Hazard Areas.** Require development to avoid or minimize potential hazards from earthquakes and unstable ground conditions.	
Implementing Program EH-2.a	**Require Geotechnical Reports.** Continue to require any applicant for land division, master plan, development approval, or new construction in a geologic hazard area to submit a geotechnical report prepared by a State-certified Engineering Geologist or a Registered Geotechnical Engineer that: • evaluates soil, slope, and other geologic hazard conditions; • commits to appropriate and comprehensive mitigation measures sufficient to reduce risks to acceptable levels, including post-construction site monitoring, if applicable; • addresses the impact of the project on adjacent lands, and potential impacts of off-site conditions; and • meets the requirements of other agency regulations with jurisdiction in the hazard area, such as Bay Conservation and Development Commission requirements for the safety of fills consistent with the Bay Plan.	
Implementing Program EH-2.b	**Require Construction Observation and Certification.** Require any work or construction undertaken to correct slope instability or mitigate other geologic hazard conditions to be supervised and certified by a geotechnical engineer and/or an engineering geologist.	

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
Implementing Program EN-3.c	**Divert Construction Waste.** Continue to implement and improve the Construction and Demolition Waste Recovery Ordinance, requiring building projects to recycle or reuse a minimum of 50% of unused or leftover building materials.	**Consistent.** The demolition debris, including excavated soil and concrete generated by the project would be recycled at the Marin Resource Recovery Center. Rip-rap and excavated soil would be reused on site where feasible. Inefficient consumption of resources would be avoided through reuse of materials. The project would be consistent with the implementing program.
Policy HAR-1.1	**Preserve Historical and Archaeological Resources**. Identify archaeological and historical resource sites.	**Consistent.** As described in Section 3.4, record searches have been conducted to identify potential cultural resources in the project area. Mitigation Measure 3.4-2 defines procedures to avoid and minimize potential impacts to previously undiscovered resources including protecting resources in place, the project would avoid damaging cultural resources consistent with the policy.
Policy HAR-1.3	**Avoid Impacts to Historical and Archaeological Resources**. Ensure that human activity avoids damaging cultural resources, where feasible.	
Goal No-1	**Protection from Excessive Noise**. Ensure that new land uses, transportation activities, and construction do not create noise levels that impair human health or quality of life.	**Consistent.** As described in Section 3.10, project construction would occur during the allowable construction hours within each jurisdiction. Project construction activities would generate noise that would result in a temporary increase in the ambient noise level; however, the noise impacts would be temporary and noise reduction measures would be implemented as defined in Mitigation Measure 3.10-1. The project would be consistent with the goal, policy, and implementing program for noise.
Policy NO-1.3	**Regulate Noise Generating Activities**. Require measures to minimize noise exposure to neighboring properties, open space, and wildlife habitat from construction-related activities, yard maintenance equipment, and other noise sources, such as amplified music.	
Implementing Program NO-1.i	**Regulate Noise Sources** - Sections 6.70.030(5) and 6.70.040 of the Marin County Code establish allowable hours of operation for construction-related activities. As a condition of permit approval for projects generating significant construction noise impacts during the construction phase, construction	

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	management for any project shall develop a construction noise reduction plan and designate a disturbance coordinator at the construction site to implement the provisions of the plan.	
Policy OS-2.4	**Support Open Space Efforts Along Streams.** Support efforts to restore, enhance, and maintain natural vegetation and other habitat values along streams in the Baylands and City-Centered corridors. Maintain strict controls and high environmental standards in these zones. Targeted streams and creeks in the Baylands and City-Centered corridors includes Corte Madera Creek.	**Consistent.** The project involves improvements to the Corte Madera Creek channel, including concrete removal, riparian plantings, and fish-passage improvements, which would enhance and maintain natural vegetation and other habitat values. The project would not conflict with this policy.
Goal PFS-1	**Adequate Public Facilities and Services.** Provide basic public facilities to accommodate the level of development planned by cities and towns and the County.	**Consistent.** The project is a flood-risk reduction project that would be owned by the District. The District, a public entity, would own the pump station and flood control facilities. The facilities have been planned to reduce long-term maintenance costs. The project would provide flood risk reduction for existing development. The project would not conflict with these goal and policies.
Policy PFS-1.2	**Plan Effectively to Minimize Costs.** Plan public facilities in cooperation with service providers to minimize short- and long-term construction, operation, and maintenance costs.	
Policy PFS-1.3	**Discourage Privatization and Commercialization.** Encourage public ownership of utilities and public service facilities by not authorizing privatization of water, sewer, law enforcement, emergency service, school, and other essential services. Consider prohibiting corporate sponsorship and commercially driven naming rights of public facilities and lands as a means to fund maintenance and improvements.	
Policy PFS-1.4	**Reduce Demand on Public Facilities.** Reduce per capita and total demand for water and wastewater treatment, and enhance stormwater management through integrated and	**Consistent.** The project includes a stormwater pump station that would have a beneficial effect on the stormwater drainage system. The project would not cause permanent increase in water demand. The project would not conflict with this policy.

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	cost-effective design, technology, and demand reduction standards for new development and redevelopment.	
Policy PFS-2.1	**Conserve Water and Utilize Sustainable Sources.** Promote conservation to increase the responsible use and reliability of water supplies. Reduce the waste of potable water through efficient technologies, design, and management practices, and through better matching of the source and quality of water to the user's needs.	**Consistent.** As discussed above, the project would not result in a permanent increase in water demand. Therefore, the project would not conflict with this goal.
Goal PFS-4	**Efficient Processing and Reduced Landfill Disposal of Solid Waste**. Minimize, treat, and safely process solid waste materials in a manner that protects natural resources from pollution while planning for the eventual reuse or recycling of discarded material to achieve zero waste.	**Consistent.** The demolition debris, including excavated soil and concrete generated by project construction, would be recycled at the Marin Resource Recovery Center. Rip-rap and excavated soil would be reused on site where feasible. Inefficient consumption of resources would be avoided through reuse of materials. The construction debris that can be reused will not be sent to the landfill and will be recycled or reused on other projects. Materials that cannot be recycled or reused will be sent to the Redwood Landfill and Recycling Center. The project would be consistent with the goal, policies, and implementing program.
Policy PFS-4.1	**Reduce the Solid Waste Stream.** Promote the highest and best use of discarded materials through redesign, reuse, composting, and shared producer responsibility. Emphasize a closed-loop system of production and consumption.	
Policy PFS-4.2	**Protect Environmental Health.** Require the use of waste processing and disposal techniques that prevent the contamination or other impairment of natural resources.	
Policy PFS-4.3	**Plan for Waste Transformation or Disposal.** Plan for the transformation or elimination of waste materials that cannot be reduced, recycled, or composted.	
Policy PFS-4.4	**Promote Regulatory Efforts**. Support State legislative or regulatory efforts that will aid in achieving zero waste.	

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
Implementing Program PFS-4.b	**Divert Construction Waste.** Continue to implement the construction and demolition recycling waste ordinance to divert construction waste from landfills.	
Goal PK-1	**A High-Quality Parks and Recreation System.** Provide park and recreation facilities and programs to meet the various needs of all county residents.	**Consistent.** The project would include construction of new and relocated recreation elements within Frederick Allen Park, including new access to the creek and relocation and realignment of Bike Route 20. Improvements also include installation of rocks, a split-rail fence to prevent encroachment into riparian habitats during the plant establishment period, and an opening in the split-rail fence that would allow for pedestrians to access the natural creek channel via an informal path. Meetings were held with the public to obtain input on the recreational design. The recreational facilities have been designed to protect the stream and riparian corridor after construction. The project would be consistent with these goal and policies.
Policy PK-1.1	**Conduct and Coordinate Park Planning.** Develop park and recreation facilities and programs to provide active recreation, passive enjoyment, and protection of natural resources as a complement to local, state, and national parks and open space in Marin County.	
Policy PK-1.2	**Consider User Needs, Impacts, and Costs.** Plan and develop any needed new park and recreation facilities and programs to meet the desires of the community and protect environmental resources.	
Policy PK-1.3	**Protect Park Resources from Impacts of Climate Change.** Identify strategies to protect park resources from the effects of climate change, such as violent weather, plant loss, or change due to moisture and temperature changes and sea level rise.	**Consistent.** Habitat created in the earthen channel area in the lower College of Marin project element would be planted with native vegetation at elevations that would accommodate sea-level rise so that the vegetation and habitat would be resilient to climate change. The project would be consistent with this policy.
Goal PS-3	**Effective Emergency and Disaster Preparedness.** Provide proper emergency and disaster preparedness services through effective and coordinated emergency management plans and procedures.	**Consistent.** As discussed in Section 3.8, the project would not affect implementation of an emergency operation plan, emergency response plan, or an emergency evacuation plan for Marin County. The project would reduce flood risk and

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
Policy PS-3.1	**Plan Thoroughly for Emergencies.** Ensure that the County, its citizens, businesses, and services are prepared for effective response and recovery in the event of emergencies or disasters.	would therefore reduce the risk of flooding related emergencies. The project would not conflict with the goal or policy.
Goal PS-4	**Decreased Exposure to Hazardous Materials.** Reduce the risks to human and environmental health from hazardous materials.	**Consistent.** As discussed in Section 3.8, project activities are required to comply with numerous hazardous materials and stormwater regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety and to reduce the potential for a release of construction-related fuels or other hazardous materials to water bodies. The project would be consistent with the goal and policy.
Policy PS-4.1	**Regulate and Reduce Hazardous Material Use.** Control the use and storage of hazardous materials to minimize their presence in, and potential dangers to, the community and environment.	
Goal TR-1	**Safe and Efficient Movement of People and Goods.** Provide a range of transportation options that meet the needs of residents, businesses, and travelers.	**Consistent.** Construction of the project would temporarily disrupt bicycle and recreational access on Bike Route 20 within Frederick Allen Park for a period of seven months. Mitigation Measure 3.13-1 requires detours for bicyclists and pedestrians to continue to provide safe bicycle and pedestrian access from Ross Commons to the College of Marin while the multi-use pathway is closed. The proposed multi-use pathway in Frederick Allen Park would continue to provide pedestrian and bicyclist transportation after construction. The project is consistent with this goal.
Goal WR-1	**Healthy Watersheds**. Achieve and maintain proper ecological functioning of watersheds, including sediment transport, groundwater recharge and filtration, biological processes, and natural flood mitigation, while ensuring high-quality water.	**Consistent.** The project would improve ecological functions by removing concrete from a segment of the Corte Madera Creek channel and increasing natural water quality and biological processes within the portion of Corte Madera Creek that is

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
Policy WR-1.2	**Restore and Enhance Watersheds**. Support watershed restoration efforts, coordinate County watershed activities with efforts by other groups, and simplify permit acquisition for watershed restoration and enhancement projects.	restored. The project design include channel stabilization measures to control erosion. The project would implement stormwater pollution prevention best management practices (BMPs) and would prepare a SWPPP that includes BMPs for sediment and erosion control.
Implementing Program WR-1.f	**Require Stream Restoration Projects.** Require restoration of streams in conjunction with associated land use approvals to improve groundwater recharge and filtration and to ensure high-quality water. Restoration projects should follow the design principles of natural channel restoration utilizing geomorphic concepts.	
Policy WR2.3	**Avoid Erosion and Sedimentation**. Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and onsite sediment retention. Require developments to include onsite facilities for the retention of sediments and, if necessary, require continued monitoring and maintenance of these facilities upon project completion	
Implementing Program WR-2.b	**Integrate Bay Area Stormwater Management Agencies Association Stormwater Quality Protection Guidelines into Permitting Requirements for All Development and Construction Activities.** All projects should integrate stormwater pollution prevention design features for water quality protection to the extent feasible, such as those included in the Bay Area Stormwater Management Agencies Association Start-at-the-Source manual and the Tools Handbook.	

Element and Goal, Policy or Implementing Program Number	Goal, Policy, or Implementing Program Language	Analysis
	Town of Ross General Plan	
Housing Goal	**Protect and Enhance Existing Housing, Community Character, and Resources.** Maintain the high quality of existing housing and community character, and assure energy efficiency in new and existing housing	**Consistent.** The project would provide flood protection and enhance natural creek conditions including increased riparian habitat. The reduced flood risk and increased natural creek conditions consistent with the natural creek conditions in Unit 4 in the Town of Ross would enhance the existing community character and would not conflict with this goal.
	Kentfield/Greenbrae Community Plan	
Goal 10	To the greatest extent possible, preserve the natural beauty and view corridors of the planning area. Protect and enhance environmental resources in accordance with policies of the Countywide Plan.	**Consistent.** The project would improve fish passage, natural creek processes, fish and riparian habitat adjacent to the creek, and recreational amenities along the creek corridor. The project is located in an urban area and within a confined viewshed and the proposed floodwalls would be visually consistent with the existing floodwalls. The project would not conflict with this goal.

Source: (Marin County, 2007; Kentfield Greenbrae Planning Group and Marin County Planning Department, 1987; Town of Ross, 2007)

	Significance Determination
Impact 3.16-3: The project would not result in substantial alteration of the character or functioning of the community or present or planned use of an area.	**Construction: Less than Significant**
	Operation and Maintenance: Less than Significant

The project would not alter the present or planned use of an area. The existing land use in the project area would remain after construction and during operation and maintenance of the project. Corte Madera Creek would continue to be used as a creek and managed for flood control and habitat. Frederick Allen Park would continue to be a park and managed for recreational use. The proposed habitat and creek improvements in the park would be compatible with the recreational use.

Construction

During construction, the project would involve temporary disturbance and permanent modifications along the Corte Madera Creek channel. The project would result in significant modifications to Frederick Allen Park, including removal of trees, removal of the concrete channel, and creation of a natural channel and riparian floodplain, and realignment of the multi-use path. Construction would involve use of heavy equipment that would produce day-time noise levels that exceed the baseline noise levels in the residential area and would temporarily alter the character of the surrounding area. Construction would last up to seven months at Frederick Allen Park, and the temporary increase in construction noise and disturbance would not result in a substantial alteration of the character of the area.

Operation and Maintenance

Immediately following construction, the project would result in exposed earth within Frederick Allen Park and a realigned pathway. The trees and associated shade contribute to the present character of Frederick Allen Park. The removal of trees, reduction in shade, and exposure of newly graded areas would result in a change to the character of the area due to the temporary reduction in urban forest. The loss of trees could reduce the feeling of privacy of residences located across from the park. The impact would be greatest prior to the establishment of vegetation and tree growth. A planting plan for Frederick Allen Park is included in Appendix B. The planting plan includes planting of some larger trees to provide greater vegetation screening immediately after construction, but there would be a temporary reduction in tree canopy for a few years while vegetation establishes. The reduction in vegetation screening from residential areas would last for a period of up to 10 years. The project would not result in removal of vegetation from private property and the existing vegetation screening on private property would remain. The impact from reduced canopy cover would be temporary and would not permanently alter the character of the community. The impact from alteration of the character of the area would be less than significant.

Mitigation: None required.

Impact 3.16-4: The project would not induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure).	Significance Determination
	Construction: Less than Significant
	Operation and Maintenance: No Impact

Construction

Project construction would occur over a period of up to seven months and would employ an average of eight to ten construction workers per day. Construction workers would likely come from within Marin County and other Bay Area counties. While it is possible that some workers might temporarily relocate from other areas, the project is not expected to result in a substantial increase in the local population. Therefore, the minimal increase in local population from the potential short-term relocation of construction workers would result in less-than-significant impacts.

Operation and Maintenance

The project includes improvements to the concrete Corte Madera Creek flood control channel, which would improve fish passage and provide increased 25-year flood-risk reduction to residents and businesses within the Town of Ross and unincorporated Kentfield. The project would not construct housing and therefore would not directly induce growth in the watershed. In addition, the reduction in flood hazard would affect areas already developed and thus would not indirectly support population growth. Operation and maintenance of the project would, therefore, not induce unplanned population growth, and there would be no impact.

Mitigation: None required.

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4 Growth-Inducing and Cumulative Effects

4.1 Growth Inducement Potential and Secondary Effects of Growth

Section 15126.2(e) of the California Environmental Quality Act (CEQA) Guidelines requires that an Environmental Impact Report (EIR) discuss "the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment."

The Corte Madera Creek Flood Risk Management Project, Phase 1 (project) would not involve any housing construction and therefore would not induce growth directly by constructing housing that would attract people to the area. Project construction would not extend roads or other infrastructure that could indirectly induce growth. Given the size and availability of the regional workforce, project construction would not be expected to induce demand for housing by attracting a substantial number of workers from outside the region. Nor would the project provide new permanent employment opportunities that could attract workers to the area; long-term operation of the project would not increase the number of workers employed by the District.

In some cases, a flood-risk reduction project can remove an obstacle to growth. However, in this case, the project would reduce flood risk in existing developed areas. The project would primarily result in reduced flood risk for 10- and 25-year flood events. The 100-year floodplain would remain similar to existing conditions. Because planning restrictions are focused around the 100-year floodplain, the project would not remove a barrier to development but would improve flood protection in previously developed areas. The project would not allow additional growth to occur nor would it change the locations where this growth is planned to occur. Consequently, implementation of the project would not affect current and/or projected population growth patterns within Marin County and, therefore, would not have a growth-inducing impact.

4.2 Significant Irreversible Changes

Sections 15126(c) and 15126.2(d) of the CEQA Guidelines require a discussion of the significant irreversible environmental changes of a project.

Irreversible commitments of resources are those which cause either direct or indirect use of natural resources such that the resources cannot be restored or returned to their original condition. Construction activities associated with the project would result in an irretrievable and irreversible commitment of natural resources through direct consumption of fossil fuels and use of materials. Construction would include the short-term use of electricity and refined petroleum products during the operation of construction equipment (primarily gas, diesel, and motor oil). The energy consumption for construction would not result in substantial depletion of non-renewable energy resources and would not permanently increase reliance on energy resources that are not renewable. Construction activities would not reduce or interrupt existing electrical or natural gas services such that existing supplies would be constrained.

Project operations that would affect irretrievable resources would be limited to annual maintenance activities. Project maintenance would involve activities similar to maintenance of the existing flood control channel. Maintenance activities would result in irreversible and irretrievable use of energy and material resources from annual testing and emergency use of the stormwater pump station generator, use of electricity to power the stormwater pump station during storms, and use of diesel fuel and oil for maintenance vehicles and equipment. The commitment of non-renewable resources usage would be minor, and therefore, would not be significant.

The use of the nonrenewable resources would not affect the availability of these resources for other needs within the region. Additional information regarding irreversible changes or resource use is discussed in Section 3.5 Energy.

4.3 Cumulative Impacts

Cumulative impacts, as defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects that, when taken together, are "considerable" or that compound or increase other environmental impacts. A cumulative impact from several projects is the change in the environment that would result from the incremental impact of each project when added to those of other closely related past, present, or probable future projects. Section 15130 of the CEQA Guidelines provides the following pertinent guidance for cumulative impact analysis:

1. An EIR shall discuss cumulative impacts of a project when the project's incremental effect is "cumulatively considerable" (defined by CEQA Guidelines section 15065(e)(3) as the incremental effects of an individual project are considerable when viewed in connection with the effects of past, current, and probable future projects, including those outside the control of the agency, if necessary).
2. An EIR should not discuss impacts that do not result in part from the project evaluated in the EIR.
3. A project's contribution is less than cumulatively considerable, and thus not significant, if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.

4. The discussion of impact severity and likelihood of occurrence need not be as detailed as for effects attributable to the project alone.
5. The focus of analysis should be on the cumulative impact to which the identified other projects contribute, rather than on attributes of the other projects that do not contribute to the cumulative impact.

CEQA Guidelines Section 15130(b)(1) provides two approaches to a cumulative impact analysis; the analysis can be based on (a) a list of past, present, and probable future projects producing related or cumulative impacts; or (b) a summary of projections contained in a general plan or related planning document.

Cumulative impact analysis considers the effects of the project together with those of other past, present, or probable future projects. The cumulative considerations and impacts for each section are summarized below. Each analysis of cumulative impacts is based on the same setting, regulatory framework, and significance criteria as the project-specific analysis. Additional mitigation measures are identified if the cumulative analysis determines that a significant cumulative impact could occur and the project's contribution to a significant cumulative impact would be considerable, even with project-level mitigation.

As provided for in CEQA Guidelines Section 15130(b)(1), the analysis in this EIR employs the list-based approach for defining projects to be considered in the cumulative impact analysis — that is, the analysis is based on a list of past, present, and probable future projects that could result in related or cumulative impacts. The probable future projects are subject to independent environmental review and consideration by approving agencies. Consequently, it is possible that some of the projects will not be approved or will be modified prior to approval (e.g., as a result of the CEQA process).

Projects that are relevant to the cumulative analysis include those that could have incremental effects on the same environmental resources and would have similar environmental impacts as those identified for the project in this EIR. The following factors were used to determine an appropriate list of relevant projects to be considered in the cumulative analyses:

1. **Similar Environmental Impacts.** Whether a project contributes to effects on the same environmental resources that are also affected by the project and would have similar or related environmental impacts as those discussed in this EIR (Sections 3.1 through 3.17).
2. **Geographic Scope of the Area Affected and Location.** Whether a project is located within the defined geographic scope for the cumulative effect. The geographic scope of cumulative projects depends on the resource affected and is identified within each section of the EIR. The geographic scope generally coincides with the physical environment described in the setting and could include the areas adjacent to the proposed construction. For some potential impacts, however, the geographic scope would extend farther, such as for the discussion of traffic in which the regional roadway network is relevant, or the

evaluation of air quality effects in which the regional air basin is the appropriate geographic scope for the analysis.

3. **Timing and Duration of Implementation.** Whether the schedule of activities for a relevant project would need to coincide in timing with the effects of the project to result in cumulative impacts. For temporary impacts such as noise and traffic, the cumulative analyses consider the short-term cumulative effects of those projects with overlapping construction schedules as well as the long-term cumulative effects of those projects that would be in operation concurrently with the project and would affect the same environmental resources.

Table 4.3-1 describes the past, present, and probable future projects that are considered in the cumulative analyses (based on the factors described above), and their locations are shown on Figure 4.3-1. The list includes projects that have overlapping construction schedules with the project (or would be completed prior to or following project construction) and that would be constructed in the general vicinity of the project elements. The list also includes projects that would be in operation concurrently with the project.

The cumulative analyses presented below first consider whether there is an impact of the project that could result in adverse physical effects on the environment. If so, the cumulative analysis considers whether any of the projects listed in Table 4.3-1 would result in related impacts or affect the same environmental resources as the project, resulting in a cumulative impact. If the cumulative impact is considered significant based on the identified significance criteria, the analysis next considers whether the project's contribution would be cumulatively considerable, and therefore significant. If the project's contribution would be cumulatively considerable, mitigation measures are identified to reduce the project's contribution to a less-than-significant level. If there is no feasible mitigation to reduce the project's contribution to a less-than-significant level, the project's contribution to the cumulative impact is considered significant and unavoidable.

Table 4.3-1 Projects Considered in Cumulative Impact Analysis

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
1	Access Ramp to the Corte Madera Creek Flood Control Channel	The project would involve construction of a new permanent concrete access ramp. The ramp would be constructed within the District's property at the intersection of Locust Avenue and Cedar Avenue and would provide vehicular and equipment access into the Corte Madera Creek flood control channel. The access ramp would be approximately 15 feet wide, 70 feet long, and sloping from Cedar Avenue down to the existing channel at an approximately 15-percent grade. A 6-foot-high flood gate would be installed across the ramp near where the ramp meets Cedar Avenue.	Project planning	• Construction completion scheduled in summer 2021.
2	Meadow Way Bridge (Town of Fairfax)	The Meadow Way Bridge has a low Sufficiency Rating of 44.1 out of 100 and has been designated as "functionally obsolete" by Caltrans. The Town of Fairfax proposes to replace the old bridge with a single-span concrete-arch replacement bridge. The replacement bridge would allow safe passage for both automobiles and pedestrians. The proposed replacement bridge would also include raised reflective pavement markers at proper intervals to alert the drivers and pedestrians of the two separate travel zones. The replacement bridge would comply with federal and state design codes and weight limits.	The CEQA document was adopted on June 3, 2020, by the Town of Fairfax Council.	• Construction is anticipated to begin and complete in 2020.
3 and 4	San Anselmo Flood Risk Reduction Project (Marin County Flood Control & Water Conservation District)	The project is part of the District's 10-Year work plan to mitigate the 25-year flood event in the Ross Valley. The project consists of three District components: 1) the Sunnyside Nursery Flood Diversion and Storage Basin at 3000 Sir Francis Drake Boulevard; 2) the removal of buildings at 632–634 San Anselmo Ave in San Anselmo (Building Bridge #2), a structure that partially obstructs the flow of San Anselmo Creek and related creek restoration; and 3) flood mitigation measures on three	The contract to perform the final phase of design work was approved by the District Board of Supervisors on March 31, 2020.	• Preliminary excavation of the Sunnyside Nursery basin started in September 2020. • The San Anselmo building demolition work was conducted in May 2020.

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
		downstream private properties that may see a rise in water surface due to the removal of BB2 in San Anselmo.		• The creek related work at both sites are anticipated to begin in Summer 2021.
5	Hillview Pump Station and Stormdrain Improvements (Marin County Flood Control & Water Conservation District)	The City of Larkspur is seeking alternatives to the maintenance-intensive need to perform sediment removal in Corte Madera Creek at storm-drainage outfalls in Hillview Gardens. The project would involve reconfiguring of the storm-drain system in the Hillview Garden neighborhood and rerouting to a new storm drain pump station on Bon Air Road.	The project is currently undergoing feasibility phase under a cost-share agreement between the District and City of Larkspur.	• Construction and future planning are pending on the result of the feasibility study and the timing is unknown.
6	Winship Bridge Replacement Project (Town of Ross)	The project involves replacing the existing Winship Avenue Bridge with a new bridge that is designed to meet current roadway and sidewalk design standards and improve conveyance capacity within San Anselmo Creek by eliminating the arches and center bridge pier in the waterway, widening the opening and raising the elevation of the bridge deck. Other project features would include new curb, gutter, sidewalk, and accessible ramps between Sir Francis Drake Boulevard and Winship Avenue intersections.	The project IS/MND was approved in March 2020	• Construction is scheduled to begin in 2022.
7	375 Crown Road LLC Design Review (P2028) (Marin County Community Development Agency)	This project would include construction of 1,762 square feet of additions to a residence on a developed lot in Kentfield. The proposed development would also include remodeling of a pool and deck remodel with a height of 10 feet above surrounding grade and outward facing walls over 4 feet.	Application in review	• Uncertain
8	Adamson Variance (P2796) (Marin County Community Development Agency)	The applicant proposes to construct a new 390-square-foot addition onto an existing residence in Kentfield.	Approved	• Uncertain

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
9	Allbin Design Review and Accessory Dwelling Unit (P2856)	The applicant proposes to tear down an existing garage and is requesting Design Review and Accessory Dwelling Unit Permit approval to construct a new two-story structure on a developed lot in Kentfield.	Application in review	• Uncertain
10	Brewer Design Review (P2827) (Marin County Community Development Agency)	The applicant proposes to construct a new second-story 300-square-foot addition onto an existing residence in Kentfield.	Application filed	• Uncertain
11	Cedar Tentative Map (P2801) (Marin County Community Development Agency)	The applicant proposes to divide the site into two parcels, retaining the existing home and work shed on Parcel 1 at 8,483 square feet. The remaining portion will become Parcel 2 and will be 6,886 square feet, to include the existing garage.	Application in review	• N/A
12	Brownridge Design Review/Tree Removal (P2780) (Marin County Community Development Agency)	The applicant proposes to tear down an existing residence on a developed lot, rendering the lot vacant, to construct a new 4,694-square-foot residence with a 540-square-foot attached garage and to remodel an existing guest house. Various site improvements proposed by the applicant include installation of a new pool and landscaping.	Application in review	• Uncertain
13	Christensen Design Review (P2820) (Marin County Community Development Agency)	The applicant proposes to remodel and expand an existing residence on a 27,009-square-foot lot in Kentfield. The existing 4,735-square-foot residence would be enlarged by 990 square feet. Additionally, the applicant proposes the construction of a 408 -square-foot accessory structure.	Application filed	• Uncertain
14	Cooney Design Review/Tree Removal (P2390) (Marin County	The applicant proposes to construct a new 8,576-square-foot single-family residence on a vacant lot in the community of Kentfield. The project includes a proposal to remove two trees classified as “Protected” per Section	Application in review	• Uncertain

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
	Community Development Agency)	22.130.030 of the Marin County Development Code to accommodate construction of the residence and associated site improvements.		
15	Morgan Design Review (P2808) (Marin County Community Development Agency)	The applicant proposes to remodel and expand an existing residence on an approximately 21,000-square-foot developed lot in Kentfield.	Application filed	• Uncertain
16	Marin Healthcare District Design Review (P2787) (Marin County Community Development Agency)	The Marin Health Care District proposes to construct a new five-story, 100,000-square-foot Ambulatory Services Building (ASB) with ground level footprint totaling approximately 20,000 square feet; a new six-story parking structure with ground-level footprint totaling approximately 20,000 square feet, which would be constructed adjacent to the existing parking structure on an existing surface parking lot; and a pedestrian bridge which would connect the existing and proposed parking structures with the new proposed ASB. Other improvements would also be entailed in this project, including the following: site grading to accommodate the new parking structure and ASB; tree removal and planting; on- and off-site landscaping; lighting, wayfinding and identification signs; and roof of the garage structure consisting of solar.	Application in review	• Uncertain
17	Swanson Design Review (P2838) (Marin County Community Development Agency)	The applicant is proposing to construct a new, second-story (above a detached garage), 483-square-foot ADU on a developed lot in Kentfield.	Application in review	• Uncertain
18	Marin Healthcare District Design Review/Sign Review (P2192) (Marin	The Marin Healthcare District proposes to construct the next phase of Marin General Hospital redevelopment project. This phase of construction involves renovation of the existing West Wing building and construction of an	Application in review	• Uncertain

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
	County Community Development Agency)	attached, one-story 3,500-square-foot addition. The new construction, along with the renovation, would create a new primary hospital entry, lobby, waiting area, admitting area, café and other associated uses. Other improvements would also be included in this phase, including the following: tree removal and planting, on- and off-site landscaping, lighting, wayfinding and identification signs, midblock pedestrian walkway, relocation of a bus stop, new pedestrian and vehicle entrances, and a pick-up/drop-off circular turnaround as well as off-site improvements to Bon Air Road to create a left-turn pocket into the new vehicular entrance.		
19	Nelson Design Review (P2738) (Marin County Community Development Agency)	The applicant is proposing to construct three new additions totaling 149 square feet onto an existing residence in Kent Woodlands. Various site improvements would also be entailed in the proposed development, including removal of a detached accessory structure.	Approved	• Uncertain
20	Real Equity Tree Removal (P2622) (Marin County Community Development Agency)	The applicant is proposing to remove one heritage redwood tree to accommodate a fire truck turnaround on a lot in unincorporated Kentfield currently undergoing construction.	Approved	• The project is currently under construction.
21	Lower Corte Madera Creek Improvement Study (Marin County Flood Control & Water Conservation District)	The Lower Corte Madera Creek Improvement Study will provide a comprehensive assessment of the current condition of the levee and creek system downstream of the concrete channel and identify and provide recommendations for improvements. The Study is funded by a grant the District received under the Local Levee Assistance Program (LLAP) from the California Department of Water Resources (DWR) that will provide 55% reimbursement of costs for both past and future work covered under the grant. The Study is intended to assess the need for future projects and consider potential	The Study reports were completed in 2019.	• The schedule for the project construction is difficult to estimate because it is dependent upon obtaining grant funding.

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
		project concepts that could be partially funded for final design and construction under the LLAP or from other funding sources.		
22	Lower Sleepy Hollow Creek Improvements (Marin County Flood Control & Water Conservation District)	The Lower Sleepy Hollow Creek Improvements Project is a portion of the Ross Valley Flood Protection & Water Program. Most creek improvements are proposed along Sleepy Hollow Creek from Broadmoor Avenue Bridge down to the Taylor Street Bridge. The goal of all the improvements is to create additional creek-flow capacity. Improvements include bridge replacements, retaining-wall replacements, bank stabilization, building relocation or removal, creek-channel enlargement, concrete removal from the creek bed, and flood barriers along the top of the creek bank.	As of July 2016, Stetson Engineers is working on the Feasibility Study for the project.	• The schedule for the project construction is difficult to estimate because it is dependent upon obtaining grant funding.
23	Corte Madera Creek Project Phase II (Friends of Corte Madera Creek Watershed)	Corte Madera Creek Project Phase II would include removal of the existing concrete channel from College Avenue along College of Marin property. The channel bed would be in natural substrate. The right bank would be laid back to create a natural creek slope. The left bank would remain with either an existing concrete wall, a new shorter wall, or large rock embankment to protect an existing Ross Valley Sanitation District owned sewer pipeline that runs parallel to the concrete channel left bank.	Project planning	• Not currently scheduled. Engineering and environmental for Phase 2 will begin after completion of Phase I.
24	Sir Francis Drake Boulevard Rehabilitation Project (Marin County Department of Public Works)	The project consists of various physical modifications to Sir Francis Drake Boulevard, including repaving, pedestrian/cyclist safety improvements, striping, intersection and signal improvements, traffic operation improvements, utility infrastructure improvement, and new street lighting.	In construction	• June 2020 – Construction began at the center of the project area. Construction has started in the western and eastern segments of the project. • December 2021– Construction is

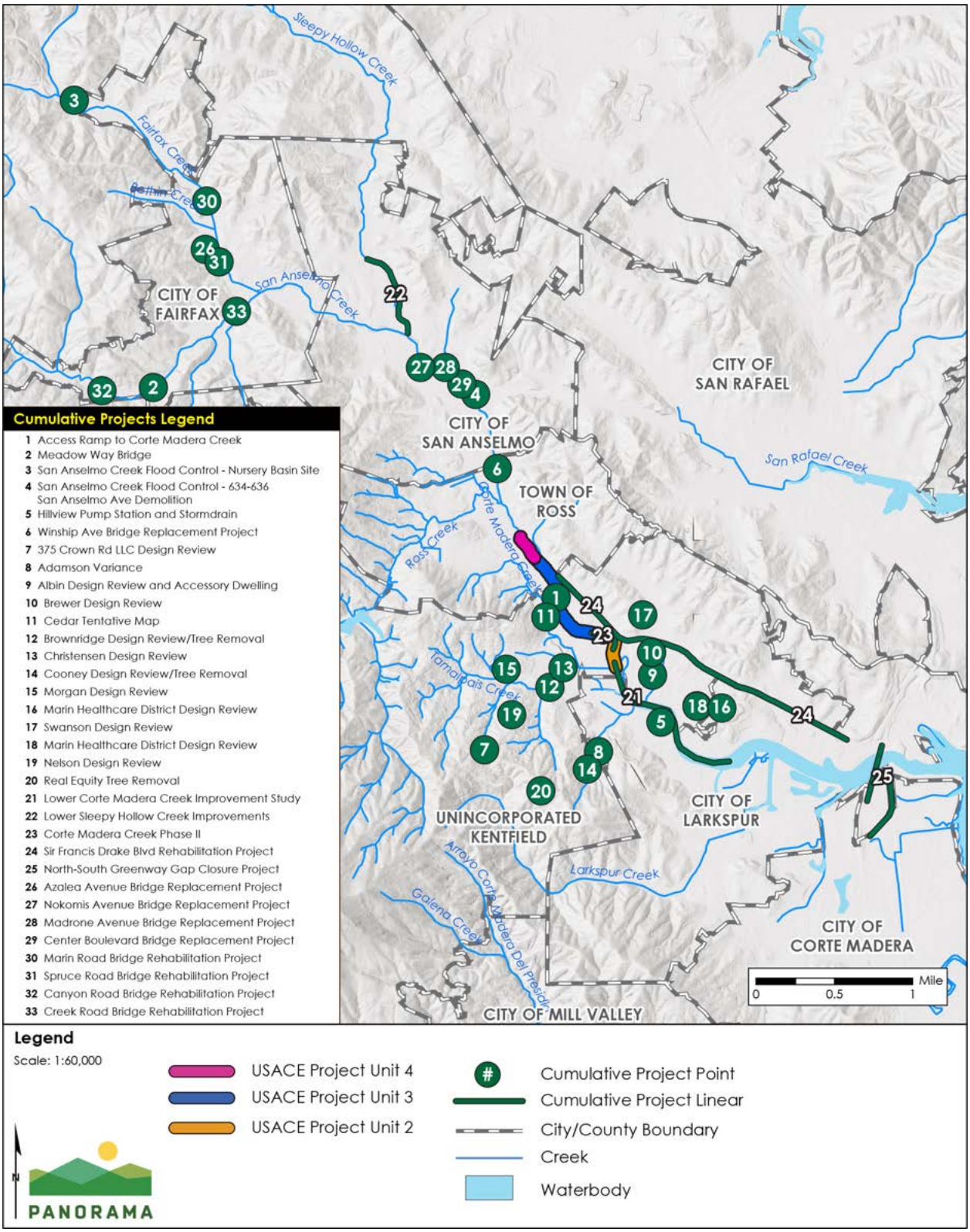
Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
				anticipated to be completed.
25	North-South Greenway Gap Closure Project (California Department of Transportation and Transportation Authority of Marin)	The project will close a key gap in the local and regional non-motorized transportation network between the Central Marin Ferry Connector Bridge (CMFC) and the existing multi-use paths at the intersection of Old Redwood Highway and Wornum Drive. The project includes two segments, the Northern Segment and the Southern Segment. The Northern Segment includes replacing the existing narrow sidewalk along the U.S. Highway 101 northbound off-ramp with a wider multi-use pathway and adding a multi-use pathway along a portion of Old Redwood Highway. The Southern Segment includes the area between Corte Madera Creek and Wornum Drive.	The planning, environmental review, and final design process is underway for the Northern Segment. The Southern Segment has been suspended for financial reasons pending identifications of additional funding.	• Northern Segment – construction is anticipated to begin in early 2021 and complete in mid-2022. Pathway closures during construction would be limited to nighttime hours. • Southern Segment – construction schedule is difficult to estimate because it is dependent upon obtaining grant funding.
26	Azalea Avenue Bridge Replacement Project	The proposed bridge replacement project at Azalea Avenue in the Town of Fairfax will remove and replace the existing bridge over Fairfax Creek. The existing bridge configuration restricts flow in the creek and causes water to back up and overtop creek banks during large flood events. By enlarging the bridge opening, Fairfax Creek will have increased flow capacity, which will reduce the risk of flooding in the Fairfax area.	The project is currently in planning.	• Construction has not been scheduled, but could begin as early as 2022.
27	Nokomis Avenue Bridge Replacement Project	The Town of San Anselmo is planning to replace the Nokomis Ave. bridge over San Anselmo Creek, which is functionally obsolete. The replacement bridge will be designed to pass a 100-year storm event within the channel. In addition to the bridge being replaced, there will be temporary in-channel work required to remove the existing bridge piers, abutments, excavate for the proposed bridge foundations, and relocate some utilities.	The project is in planning with Caltrans and the Town of San Anselmo	• The timing of construction is difficult to estimate because the project is in design and planning and requires CEQA compliance and permits. Construction is anticipated to occur within 5 years.

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
28	Madrone Avenue Bridge Replacement Project	The Town of San Anselmo is planning to replace the Madrone Ave. bridge over San Anselmo Creek, which is functionally obsolete. The bridge design will need to be consistent with the existing roadway classification and the Town's complete streets policy. The bridge would be replaced with a similar two-lane bridge that will be wider to accommodate vehicles, bicyclists, and pedestrians with standard traffic lanes, shoulders, and ADA compliant sidewalks. Design changes will be considered to improve safety for all roadway users and alleviate congestion at the nearby intersections of Center Boulevard with San Anselmo Avenue/Sycamore Avenue and Bridge Avenue. The bridge will also be designed to pass a 100-year storm event within the channel.	The project is in planning with Caltrans and the Town of San Anselmo	• The timing of construction is difficult to estimate because the project is in design and planning and requires CEQA compliance and permits. Construction is anticipated to occur within 5 years.
29	Center Boulevard Bridge Replacement Project	The Town of San Anselmo is planning to replace the bridge over San Anselmo Creek, which is functionally obsolete. All design alternatives will focus on replacement of the existing bridge with a similar two-lane bridge that will be wider to accommodate vehicles, bicyclists, and pedestrians with standard traffic lanes, shoulders, and ADA compliant sidewalks. Design changes will be considered to improve safety for all roadway users and alleviate congestion at the nearby intersections of Center Boulevard with San Anselmo Avenue/Sycamore Avenue and Bridge Avenue. The bridge will also be designed to pass a 100-year storm event within the channel. In addition to the bridge being replaced, there will be temporary in-channel work required to remove the existing bridge piers, abutments, excavate for the proposed bridge foundation and relocate some utilities	The project is in planning with Caltrans and the Town of San Anselmo	• The timing of construction is difficult to estimate because the project is in design and planning and requires CEQA compliance and permits. Construction is anticipated to occur within 5 years.

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Status	Construction Schedule
30	Marin Road, Spruce Road, Canyon Road, and Creek Road Bridge Rehabilitation	The Town of Fairfax is planning upgrades to four bridges which span San Anselmo and Fairfax Creeks on Marin Road, Spruce Road, and Canyon Road. Major upgrades may require seismic retrofits to address structural issues.	The projects are in early planning and require design and environmental review.	• The construction schedule cannot be determined due to limited information on the design and environmental review process.

Sources: (Marin County DPW, 2020; Town of Fairfax, 2020; The District, 2020; The District, 2019; Marin County Community Development Agency, 2020; The District, 2018; The District, 2015a; The District, 2015b; Simonitch, 2020; Houston, 2020) (Larkspur & Corte Madera, 2020)

Figure 4.3-1 Cumulative Projects Locations



Sources: (Tele Atlas North America, Inc. 2019, GHD 2020, USGS 2019, US Geological Survey 2013)

4.4 Cumulative Impact Analysis

The following subsections include a discussion of cumulative impacts by resource topic and, where appropriate, a description of the mitigation measures that would avoid or lessen the project's contribution to a significant cumulative impact. Pursuant to CEQA Guidelines Section 15130(a)(1), an EIR should not discuss impacts that do not result in part from the project evaluated in the EIR. The cumulative impact analysis includes only those impacts that would result from project implementation of the project. The project would have no impact on the following resource topics and would, therefore, not contribute to cumulative impacts on the following:

- Agricultural and forestry resources
- Mineral resources
- Population and housing
- Wildfire
- Socioeconomics

4.4.1 Aesthetics and Visual Resources

Geographic Scope

The geographic scope for the analysis of potential cumulative aesthetic impacts includes the project area and project vicinity within publicly accessible viewsheds of the project, as described in Section 3.1 Aesthetics and Visual Resources. The project viewshed is limited to those areas in close proximity to the project due to the surrounding development and lower elevation of the Corte Madera Creek flood control channel.

Cumulative Projects

Concurrent construction of the project with cumulative projects proposed within the same viewsheds could result in visual impacts during construction. Projects located within the same viewshed as the proposed project include the access ramp to Corte Madera Creek (#1), Lower Corte Madera Creek Improvement Study (#21), and Corte Madera Creek Project Phase II (#23). All other cumulative projects that would be constructed concurrently with the proposed project are located at a distance from the project and are not located within the same viewshed as the proposed project. There would be no cumulative construction or operational aesthetic impacts with projects that are located outside of the project viewshed.

Cumulative Impact

Impacts Avoided

The project would not result in cumulative impacts from new sources of lighting or glare or impacts on scenic highways.

Scenic Vistas

The proposed project and cumulative projects are not located within a designated scenic vista, but the project and cumulative projects are located within the viewshed of ridgelines along that include scenic vistas. Due to the limited area of new land disturbance and changes proposed at

a distance from any scenic vista, the cumulative impact on scenic vistas would be less than significant.

Visual Quality

The access ramp to Corte Madera Creek would be constructed prior to the proposed project and would be located in proximity to the floodwall. The access ramp would be a small structure that would appear similar to the existing floodwall. As discussed in Section 3.1, the proposed increase in floodwall height would also appear similar to the existing floodwall. The cumulative impact from addition of the floodwall and access ramp would be less than significant. The Corte Madera Creek Project Phase II project and Lower Corte Madera Creek Improvement Study project have not been designed, and the aesthetic impacts of these projects cannot be fully determined. The Corte Madera Creek Project Phase II and Lower Corte Madera Creek Improvement Study would be located near the lower College of Marin concrete channel removal project. Additional removal of the concrete channel and flood-control improvements to areas downstream of the concrete channel would appear consistent with the proposed concrete -channel removal and would result in a beneficial aesthetic impact. The cumulative aesthetic impact would be less than significant.

4.4.2 Air Quality

Geographic Scope

The geographic scope for criteria air pollutants is the San Francisco Bay Air Basin because regional air pollution is cumulative by nature within the air basin. The geographic scope for TACs includes projects within 1,000 feet of the project area because of the limited TACs generated by the project and because TACs would disperse at distances greater than 1,000 feet.

Cumulative Projects

Criteria Air Pollutants

The analysis of criteria pollutants assumes all projects that would be implemented within the air basin and the existing exceedance of the air quality standards. No single project by itself would be sufficient in size to result in regional non-attainment of ambient air quality standards. The project-level thresholds for criteria air pollutants set by Bay Area Air Quality Management District (BAAQMD) are based on levels by which new sources are not anticipated to contribute to an air quality violation or result in a cumulatively considerable net increase in criteria air pollutants. Therefore, if a project would exceed the identified construction or operational significance thresholds, its emissions would be cumulatively considerable, and if a project would not exceed the construction or operational significance thresholds, its emissions would not be cumulatively considerable.

Toxic Air Contaminants

The only cumulative projects proposed within 1,000 feet of the proposed project include the Access Ramp to Corte Madera Creek (#1), the Cedar Tentative Map (#11), the Corte Madera Creek Project Phase II (#23), and the Sir Francis Drake Boulevard Rehabilitation (#24).

Cumulative Impacts

Criteria Air Pollutants

As discussed in Section 3.2 Air Quality, the San Francisco Bay Air Basin is in nonattainment for ozone, PM_{10}, and $PM_{2.5}$. The regional nonattainment status reflects a significant cumulative air quality impact. As discussed in Section 3.2, neither construction nor operation of the project would exceed the criteria air-pollutant thresholds set by BAAQMD. The criteria air-pollutant thresholds were set by BAAQMD to address the significant cumulative impact. The project's contribution to the cumulative air quality impact would be less than considerable and therefore less than significant.

Toxic Air Contaminants

The cumulative projects and the proposed project would generate toxic air contaminants (TACs) during construction and operation. The proposed project would include a new generator, but the generator would only be used up to 50 hours per year and would not be a considerable source of TACs. The Access Ramp to Corte Madera Creek and Sir Francis Drake Boulevard Rehabilitation would be constructed a year prior to the proposed project. The Corte Madera Creek Project Phase II would be constructed several years after the proposed project because planning, engineering, and funding are still required for the project. None of the cumulative projects would generate TACs at the same time as the proposed project because the construction schedules for the cumulative projects and proposed project do not overlap.

There are five existing permitted sources within 1,000 feet of the project site. The major arterial roads (i.e., Sir Francis Drake Boulevard) in the project vicinity could contribute additional risk; however, this would be small since the road does not have a substantial amount of truck traffic in this area and adequate information on annual average traffic counts and percentage of trucks is not readily available. The HRA prepared for the project (Appendix C) includes analysis of cumulative TACs to address the existing sources and the proposed project. The quantitative analysis of TACs provided in Table 4.4-1 demonstrates that the cumulative impact would not exceed BAAQMD thresholds and would be less than significant.

Table 4.4-1 Estimated Cumulative Health Risk at the Maximally Exposed Individual Receptor

Source	Maximum Cancer Risk (in 1 million)	Chronic Hazard Index	Annual Average $PM_{2.5}$ Exhaust Concentrations ($\mu g/m^3$)
Construction			
Existing permitted stationary sources [a]	13.0	0.026	0.26
Unmitigated project construction [b]	16.5	0.039	0.12
Total cumulative construction health risk	29.5	0.065	0.38
BAAQMD significance thresholds	100.0	10.0	0.80
Threshold exceeded?	No	No	No
Operations			
Existing permitted stationary sources [a]	13.0	0.026	0.26
Unmitigated project operations [b]	0.76	0.0002	0.001
Total cumulative operational health risk	13.77	0.026	0.256
BAAQMD significance thresholds	100.0	10.0	0.80
Threshold exceeded?	No	No	No

Notes:

[a] Permitted sources include generators and gas stations. The BAAQMD Distance Multiplier Tool went to 280 meters for generators, 300 meters for gas stations, and 300 meters for other sources. The health-risk values presented are adjusted to the maximally exposed individual receptor to the proposed project.

[b] This receptor location is the location where the maximum health risk would occur based on modeling. No real-world sensitive receptor occurs at this location.

4.4.3 Biological Resources

Geographic Scope

The geographic scope for the analysis of potential cumulative biologic impacts includes the Corte Madera Creek watershed.

Cumulative Projects

Direct cumulative impacts could occur if any projects within the vicinity of the project would be constructed at the same time as the proposed project. Of the projects presented in Table 4.3-1, only construction of the Winship Avenue Bridge Replacement Project could occur concurrently with the project. Indirect cumulative impacts could occur from habitat impacts within the

watershed. The majority of the proposed projects in Table 4.3-1 include some degree of temporary or permanent habitat impacts and are therefore considered in this analysis.

Cumulative Impacts

Impacts Avoided

No Habitat Conservation Plans (HCPs) or Natural Community Conservation Plans (NCCPs) have been approved in the project area or vicinity. No significant impacts from conflicts with an HCP or NCCP would occur.

Special-Status Species

A direct cumulative impact on special-status species would occur if the proposed project and cumulative project impacted the same special-status species. The proposed project and cumulative projects would only cause direct impacts on special-status species during construction. The only cumulative project that would be constructed at the same time as the proposed project is the Winship Avenue Bridge Replacement Project. The Winship Avenue Bridge Replacement Project is located approximately 2,000 feet north of the upstream end of Unit 4. The Winship Avenue Bridge Replacement Project is located on Corte Madera Creek and could impact the same aquatic and terrestrial special-status species as the proposed project in Unit 4. The Winship Avenue Bridge Replacement Project includes mitigation measures that require species pre-construction surveys, environmental awareness training, biological monitoring, fish rescue plan, water diversion and dewatering, steelhead critical habitat and Essential Fish Habitat (EFH) protection, and nesting bird protection. Because the Winship Avenue Bridge Replacement Project construction would be short-term and the impacts would be isolated to the bridge placement area, and the project includes mitigation measures to avoid impacts on special-status species, the potential cumulative impact on special-status species would be less than significant.

Riparian Habitat, Sensitive Natural Communities, and Wetlands

The Meadow Way Bridge (#2), San Anselmo Creek Flood Control – Nursery Basin Site (#3), Winship Avenue Bridge Replacement (#5), Lower Corte Madera Creek Improvement Study (#21), Lower Sleepy Hollow Improvements (#22), and Corte Madera Creek Project Phase II (#23) involve improvements to the creek and would be expected to impact riparian habitats, sensitive natural communities, and wetlands/waters, which also occur within the proposed project area. Each of the cumulative projects would involve long-term benefits to habitat, but construction would include temporary impacts on vegetation communities and habitat. The temporal impact on riparian habitat and sensitive natural communities for the cumulative projects could overlap because of the time needed for vegetation establishment and habitat restoration. The cumulative temporal impact on riparian habitats and sensitive natural communities is significant.

The project would temporarily impact 0.55 acre of riparian habitat and entail 1.56 acres of impact on brackish marsh during construction. The proposed project would also remove oak trees and impact stream and intertidal habitat within the concrete flood control channel. The proposed project would involve a considerable contribution to the temporal impact on riparian

areas, wetlands, and sensitive vegetation communities. The District would implement Mitigation Measure 3.3-1a, 3.3-2a, and 3.3-2b. Mitigation Measure 3.3-1a requires avoidance of sensitive natural communities or compensatory mitigation for any communities that cannot be avoided. Mitigation Measure 3.3-2a requires monitoring and management of the riparian and wetland habitats created by the project to ensure the created habitat is successful and compensates for temporary impacts. Mitigation Measure 3.3-2b requires replacement planting of removed trees, including replacement for oak trees at a minimum ratio of 4:1. The mitigation measures would avoid loss of sensitive natural communities and ensure successful restoration of riparian areas resulting in increased riparian and oak woodland habitat and sensitive natural communities after construction. Therefore, the project's contribution to a significant cumulative impact would be less than considerable after mitigation.

Conflict with Policies Protecting Biological Resources

The cumulative projects are each required to comply with local policies and ordinances for the protection of biological resources. All cumulative projects would need to obtain a tree removal permit for any applicable tree removal. There would be no cumulative conflict with policies and ordinances for the protection of biological resources.

Invasive Species

The proposed project and cumulative projects located on Corte Madera Creek could introduce invasive aquatic and terrestrial species to the area or transport materials to other areas through weeds or eggs on construction equipment or worker boots/waders. The cumulative impact from introduction and spread of invasive species and pathogens is potentially significant. The proposed project could contribute considerably to the cumulative impact because the proposed project would introduce construction equipment to the creek and could introduce new weeds or aquatic invasive species to the areas of temporary impact or transport aquatic invasive species to other areas. The District would implement Mitigation Measures 3.3-1e and 3.3-1g to avoid introduction or transfer of invasive species. Mitigation Measure 3.3-1e would avoid or minimize significant impacts from invasive species by requiring washing of vehicles and specific requirements to prevent introduction of pathogens and invasive plant species. Mitigation Measure 3.3-1g would avoid significant impact from invasive aquatic species through defining specific requirements to ensure construction equipment and materials are free of invasive aquatic species. These mitigation measures would prevent introduction of pathogens and invasive plant species to Corte Madera Creek and the surrounding area. Because the mitigation would avoid introduction of invasive species into the area, the project's contribution to the potentially significant cumulative impact would be less than significant with mitigation.

4.4.4 Cultural Resources and Tribal Cultural Resources

Geographic Scope

Impacts related to cultural resources are generally site-specific, and they depend on the specific localized resources affected and their potential to be found in the area. They are not typically additive or cumulative in nature. The project is not located within a historic district. There is no

indication that the project area has been used for human burial purpose, and no significant archaeological resources are known to exist within the project area.

Cumulative Projects

All identified current and reasonably foreseeable future projects in Table 4.3-1 that are within or in close proximity to the project area that involve ground disturbance have the potential to combine with the impacts of the project to result in cumulative impacts to unknown buried archaeological resources and human remains should they occur in the area. The only cumulative projects located close enough to the proposed project to result in cumulative impacts on cultural resources are the Access Ramp to Corte Madera Creek (#1) and Corte Madera Creek Project Phase II (#23). The remaining projects are separated from the project by a considerable distance, with intervening developed areas.

Cumulative Impacts

Impacts Avoided

The project would not affect any eligible historic built resources. The project would not contribute to significant impacts on historic architectural resources.

Archaeological Resources and Tribal Cultural Resources

As described in Section 3.4 Cultural Resources, record searches have been conducted to identify potential cultural resources in the project area. Two recorded resources were identified within the project area and eight within a 500-foot search buffer. No significant resources or resources eligible for listing in the National Register of Historic Places/California Register of Historical Resources were identified from these recorded resources. A field survey was conducted on July 28, 2020, to identify archaeological resources in the project area. No archaeological resources were found in the project vicinity. The District also consulted with Native Americans under AB 52 to identify any tribal cultural resources. As discussed in Section 3.15, no tribal cultural resources were identified in the project area. Despite these efforts and results, the inadvertent discovery of unknown archaeological resources or tribal cultural resources during construction from ground-disturbing activities cannot be entirely discounted. The inadvertent discovery of archaeological resources or tribal cultural resources resulting from the proposed project and cumulative projects could result in a significant cumulative impact on archaeological resources or tribal cultural resources if the resources were not adequately addressed to avoid destruction. Because no archaeological or tribal cultural resources are known to occur in the area, the nature of any archaeological or tribal cultural resource encountered during construction cannot be determined, and while unlikely, it is possible that resource encountered during construction of the proposed project could be part of a larger site or district that would potentially be disturbed during construction of cumulative projects. If the project were to encounter archaeological or tribal cultural resources that were part of a larger historic site or district, the project's contribution to the significant impact would be considerable. The District would implement Mitigation Measure 3.4-2, which specifies procedures to follow in the event of an inadvertent discovery to avoid damage of archaeological resources. Because Mitigation Measure 3.4-2 defines procedures to avoid and minimize

potential impacts to previously undiscovered resources including protecting resources in place, the project would avoid impacts on archaeological and tribal cultural resources with mitigation; therefore, the project's contribution to cumulative impacts on archaeological and tribal cultural resources would not be considerable, and would therefore be less than significant with mitigation.

Human Remains

No human remains are known to occur in the project area or vicinity. The cumulative projects and proposed projects would need to comply with Marin Development Code Section 22.20.040 (D), Public Resources Code Section 5097.98, and Health and Safety Code Section 7050.5, which specify requirements for discovery of human remains. No significant cumulative impact would occur due to compliance with state and county requirements for discovery of human remains.

4.4.5 Energy

Geographic Scope

The geographic scope of analysis for cumulative energy impacts is all projects within the Marin County Energy service territory since Marin County Energy would be the energy provider for the project.

Cumulative Projects

All of the cumulative projects in Table 4.3-1 are located within Marin County Energy territory. However, many of the cumulative projects would only require energy to fuel construction equipment and would not require a long-term energy supply.

Cumulative Impacts

Construction

As discussed in Section 3.5 Energy, under Impact 3.5-1, construction of the project would require the use of energy resources; however, energy consumption would be temporary and limited to the construction phases of the project. Construction would not require a large amount of energy due to the short duration of the construction (seven months) and limited amount of equipment and associated fuel requirement. In addition, the project would comply with Section 2485 of the California Code of Regulations, which reduces use of fuel during idling by limiting idling of heavy trucks traveling to and from the project area.

The projects identified in Table 4.3-1 would be subject to the same regulatory framework as the project for the use of fuel and energy during construction, which includes Bay Area Air Quality Management District Basic Construction Measures and the California Green Building Code. Compliance with the measures identified would ensure compliance with regulatory policies to minimize the potential for cumulative energy impacts. Therefore, the potential for cumulative energy impacts during construction would be less than significant.

Operation

As described in Section 3.5 Energy, under Impact 3.5-1, project operation would only require new energy resources to operate the proposed stormwater pump station. The pump station would only operate immediately following storm events when creek levels rise above the elevation of the existing outfall. The limited energy use from the project would not contribute considerably to a cumulative impact, and a significant cumulative impact would not occur.

4.4.6 Geology and Soils

Geographic Scope

The San Francisco Bay Area is a seismically active region with a wide range of geologic and soils conditions that can vary greatly within a short distance. Accordingly, geologic and soils impacts tend to be site specific and depend on the local geology and soil conditions. For these reasons, the geographic scope for potential cumulative geologic and soils impacts consists of the project elements locations and only the immediately adjacent areas with similar geologic and soil conditions. In general, to have a cumulative impact on geology and soils, two or more projects would have to be located within 1,000 feet or less to cause cumulative geologic and soils impacts.

Cumulative Projects

The Access Ramp to Corte Madera Creek (#1), Cedar Tentative Map (#11), Lower Corte Madera Creek Improvement Study (#21), Corte Madera Creek Project Phase II (#23), and Sir Francis Drake Boulevard Rehabilitation Project (#24) would occur in proximity to portions of the project.

Cumulative Impacts

Seismic Shaking and Liquefaction

Many parts of the Bay Area are at risk of personal or property damage related to seismic shaking, seiche or tsunami, or liquefaction. People working on the project would be subject to these risks, but this risk is not isolated to the project area. The project area (as with all development projects in the region) must comply with design standards developed to minimize risk from damage from seismic events. The project also does not propose any new structures that could create a risk to life or property as a result of seismic shaking. The cumulative impact would be less than significant.

Soil Loss

All cumulative projects that exceed 1 acre in surface disturbance would be required to obtain Construction General Permit coverage and implement SWPPP. The SWPPP would include best management practices to control runoff and prevent erosion. Through compliance with the Construction General Permit, the potential for erosion impacts and loss of topsoil would be reduced to less-than-significant level. The project would not contribute to a cumulative erosion impact.

Paleontological Resources

As discussed in Section 3.6 Geology and Soils, the geologic and soil units within the project area are of low paleontological sensitivity. A significant cumulative impact on paleontological resources would not occur.

4.4.7 Greenhous Gas Emissions

Greenhouses gases are by nature a cumulative impact as a result of global activities. The analysis of greenhouse gas emission presented in Section 3.7 Greenhouse Gas Emissions is in a cumulative context because the impact is inherently cumulative. The project's contribution to the significant cumulative global greenhouse gas impacts would be less than considerable, as discussed in Section 3.7.

4.4.8 Hazards and Hazardous Materials

Geographic Scope

The geographic scope of analysis for cumulative hazardous materials impacts encompasses the project area and a 0.25-mile buffer from the project and travel routes. Many impacts related to hazardous materials are largely site specific and depend on the nature and extent of the hazardous materials release as well as existing and future soil and groundwater conditions. For example, hazardous materials incidents tend to be limited to a smaller, more localized area surrounding the immediate location and extent of the release and could only be cumulative if two or more hazardous materials releases overlap spatially. (An exception to this is a groundwater plume of contaminants released from an otherwise isolated source.) Consequently, hazardous materials impacts related to routine use, accidental release, or being located on a listed hazardous materials site compiled pursuant to Government Code Section 65962.5 are site specific and are not cumulative in nature. In addition, impacts relative to hazardous materials are also time--specific.

Cumulative Projects

The cumulative projects identified in Table 4.3-1 would likely require transport of hazardous materials on Highway 101 and Sir Francis Drake Boulevard during construction. Construction of cumulative projects #1 through #5, #16, #18, and #22 through #25 would require transport of small volumes of hazardous materials for vehicle and equipment operations during construction.

Cumulative Impact

Impacts Avoided

As discussed in Section 3.8 Hazards and Hazardous Materials, the project would have no impact with respect to being located near hazardous material sites, within two miles of an airport or airstrip, or within wildland fire hazards. The project does not include the use or installation of septic tanks or alternative water disposal systems. Therefore, the project could not contribute to cumulative impacts related to these topics and are not discussed further.

Routine Use, Transport, or Disposal of Hazardous Materials
The projects identified in Table 4.3-1 would involve construction activities using equipment that would use fuels, oil and lubricants, and cleaning solvents. Construction and demolition activities are required to comply with numerous hazardous materials and stormwater regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety, to reduce the potential for a release of construction-related fuels or other hazardous materials to affect stormwater and downstream receiving water bodies, and to respond to accidental spills, if any. The cumulative impact from routine use, transport, and disposal of hazardous material would be less than significant.

Handle Hazardous Materials within 0.25 Mile of Schools
As discussed in Section 3.8 Hazards and Hazardous Materials, the project is located within 0.25 mile of three schools. The only cumulative projects located within 0.25 mile of the same schools include the Access Ramp to Corte Madera Creek (#1) and Corte Madera Creek Project Phase II (#23). Project construction equipment emissions, materials handling, and waste handling would have the potential to impact schools within 0.25 mile of the cumulative project elements. However, the proposed project and cumulative projects are required to adhere to Occupational Safety and Health Administration (OSHA) and California OSHA health and safety requirements when handing hazardous materials; adhere to Resource Conservation and Recovery Act and U.S. Department of Transportation regulations when transporting hazardous materials; and adhere to all applicable federal, state, and local laws when disposing of soil and hazardous waste. The proposed project and cumulative projects would not result in a significant cumulative impact.

Emergency Response
The proposed project would not be constructed at the same time as the Sir Francis Drake Boulevard Rehabilitation Project and would not affect potential emergency evacuation on Sir Francis Drake Boulevard. No cumulative impacts on emergency evacuation would occur.

4.4.9 Hydrology and Water Quality

Geographic Scope
The cumulative geographic scope of analysis for hydrology and water quality is the Corte Madera Creek watershed.

Cumulative Projects
All of the cumulative projects are located within the Corte Madera Creek watershed. Projects that could contribute to significant cumulative water quality impacts include the following:

- Access Ramp to Corte Madera Creek (#1)
- Meadow Way Bridge (#2)
- San Anselmo Creek Flood Control – Nursery Basin Site (#3)
- San Anselmo Creek Flood Control – 634 – 636 Demolition (#4)
- Hillview Pump Station and Storm Drain (#5)
- Winship Avenue Bridge Replacement Project (#6)

- Lower Corte Madera Creek Improvement Study (#21)
- Lower Sleepy Hollow Creek Improvements (#22)
- Corte Madera Creek Project Phase II (#23)
- Azalea Avenue Bridge Replacement Project (#26)
- Nokomis Avenue Bridge Replacement Project (#27)
- Madrone Avenue Bridge Replacement Project (#28)
- Center Boulevard Bridge Replacement Project (#29)

Cumulative Impacts

Impacts Avoided

The project would have no impact related to creating or contributing to runoff water that would exceed the capacity of stormwater drainage systems or placing housing in an area with potential for inundation by seiche, tsunami, or mudflow. Therefore, the project would not have the potential to contribute to a significant cumulative impact of these kinds. The following discussions analyze the cumulative impacts relative to flooding, water quality, erosion, and groundwater.

Flooding within the Ross Valley and Cumulative Projects

As discussed in Chapter 2, Project Description, flooding regularly occurs within the Ross Valley watershed, which includes Corte Madera Creek. The District is implementing the Ross Valley Flood Protection and Watershed Program (Program), which includes multiple projects listed in Table 4.3-1 to address the existing flooding conditions. The Program would implement a phased program over the next 30 years to achieve designated levels 10- to 25-year flood-event protection (Phase 1) and 25- to 100-year flood-event protection (Phase 2). The Program includes a combination of several flood control elements that, once collectively implemented, would provide flood-risk reduction on a watershed-wide scale. The elements include flood diversion and storage (FDS) basins, located in the upper reaches of the watershed to detain peak flows into the creek network during flood events, bridge replacements in Fairfax, San Anselmo, and Ross to remove impediments to flows in the creek and reduce localized flooding, and creek improvements in the lower end of the watershed to increase capacity and stability in the lower reaches to handle flood flows as they move through the watershed. In addition to the FDS basins and elements that increase creek capacity, the Program includes additional flood-risk reduction activities, including policies to encourage low-impact development (LID), flood preparedness, and educational activities throughout the lifespan of the Program. These elements are proposed to reduce the frequency and severity of flooding in the Ross Valley.

These proposed elements have been included after technical analysis[1] determined that they were the most suitable actions that can be taken to reduce flooding risk in the Ross Valley watershed, given the regional topography, the existing creek network, flow bottlenecks, and the constraints on available space to develop program elements. According to hydraulic model simulations, neither increasing creek capacity alone nor developing FDS basins alone would be sufficient to prevent flooding within the Corte Madera Creek watershed during a 100-year flood.[2] Notably, implementing all of the creek capacity elements alone will not provide the desired level of flood-risk reduction. To achieve 100-year flood protection, some volume of flood flows will need to be captured in FDS basins. There is some flexibility in the sizing, locations, and operation of the FDS basins throughout the watershed; however, they must be located strategically to assist in meeting the flow-rate targets in each subwatershed. By installing both FDS basins and elements that increase creek capacity, a 100-year flood event similar to the December 2005 flood could be contained within the banks of the stream network, thereby reducing flood risk throughout Ross Valley. Therefore, implementation of the Program would have a beneficial effect on cumulative flooding and flood risk within the Corte Madera Creek watershed.

In order to meet the Program's primary objective, which is to substantially reduce the frequency and severity of flooding within Ross Valley, a hydraulic analysis of the Ross Valley was undertaken to identify where flooding is occurring during various storm-event scenarios.[3] Through this analysis, a combination of critical reaches and flow targets was identified to support the design of the Program, as described below.

Critical Reaches

Based on the analysis, there are four "critical reaches" in Ross Valley where, during large floods, floodwaters overflow and escape from the creeks and flow for extended distances on the historical floodplain as separate side-streams apart from the main channel. During very large floods, these floodwaters damage structures in the floodplain and threaten public safety. Owing to their limited conveyance capacity, these four critical reaches represent the weakest links in the creek system. Accordingly, they are the focus of the Program elements aimed at increasing creek capacity. The four critical reaches are:

1. Fairfax Creek critical reach, located within the Fairfax subwatershed;

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[1] This analysis included the *Capital Improvement Plan Study for Flood Damage Reduction and Creek Management for Flood Zone 9/Ross Valley* (CIP) (Stetson Engineers Inc., 2011), the *Ross Valley Flow Reduction Study Report* (CH2M, 2015), and hydraulic modeling.

[2] The 100-year flood is the flood event that has a 1% chance of occurring or being exceeded in any year based on historical records and model projections.

[3] This analysis included the *Capital Improvement Plan Study for Flood Damage Reduction and Creek Management for Flood Zone 9/Ross Valley* (CIP) (Stetson Engineers Inc., 2011) and hydraulic modeling.

2. Sleepy Hollow Creek critical reach, located within the San Anselmo subwatershed;
3. San Anselmo Creek critical reach, including downtown San Anselmo, located within the San Anselmo subwatershed; and
4. Corte Madera Creek and Ross Creek critical reach, located within the Ross subwatershed.

Flow Targets

Increasing creek capacity in the critical reaches, while important, is not sufficient in all locations by itself to reduce flooding to protect life and property in the area. Rather, the Program must also reduce flows upstream of the critical reaches, an outcome that can be achieved by building FDS basins. Three locations in the watershed (one in each of the Fairfax, San Anselmo, and Ross subwatersheds) have been assigned flow targets – meaning locations where flows should be reduced to specified levels in order to reduce flooding downstream in the critical reaches.

The three key flow targets (#26 on Figure 4.3-1) are as follows:

1. Fairfax Subwatershed: Target 100-year flow of 1,100 cfs at the Fairfax Town Hall.
2. San Anselmo Subwatershed: Target 100-year flow of 4,540 cfs at Sycamore Bridge in San Anselmo.
3. Ross Subwatershed: Target 100-year flow of 5,540 cfs at the USGS Streamflow Gage at Ross.[4]

These targets were developed through hydraulic modeling to reflect the maximum flow rate that could be allowed at each location and still achieve containment of the anticipated flow from a 100-year flood event in the identified critical reaches, assuming all elements identified in the Program to increase the creek capacity are implemented.

Cumulative Development Projects

Implementation of projects in Table 4.3-1 may increase impervious surface areas associated with development. The largest of these projects is the Marin Healthcare District Project, which would include construction of a new five-story building and a six-story parking structure with ground level footprint totaling approximately 40,000 square feet. Each of the development projects would be required to comply with federal, state, and local requirements regarding stormwater management, including Provision E.12 of the State Water Board under the Phase II NPDES Municipal Regional Permit. Provision E.12 of the 2013 MS4 permit includes post-construction stormwater management requirements that permittees (such as Marin County) must incorporate into their land use approvals. Site design measures (such as stream setbacks and buffers, rooftop and impervious area disconnection, and vegetated swales) must be implemented for projects approved by the County that create or replace between 2,500 and

[4] The flow target of 5,540 cfs at the USGS Streamflow Gage at Ross is intentionally in alignment with the proposed design flow rate for the USACE Project.

5,000 square feet of impervious surface. Projects that create and/or replace 5,000 square feet or more of impervious surface must implement measures for site design, source control, runoff reduction, stormwater treatment, and baseline hydromodification management as defined in the 2013 MS4 permit. These requirements have been adopted by Marin County and are codified in Section 24.04.627 (Permanent Stormwater Controls for New and Redevelopment) of the Marin County Municipal Code. Compliance with local ordinances, design review, and Provision E.12 would reduce the contribution of these projects to flood conditions within the Ross Valley such that the cumulative impact from proposed development projects would be less than significant.

Cumulative Effects

Flooding

Implementation of the cumulative flood-risk reduction projects included in the Program would result in a cumulative reduction in flood risk in Ross Valley. The cumulative impact from implementation of the proposed project and cumulative flood-control projects in Ross Valley (including cumulative projects #2, 3, 4, 6, 26, 27, 28, and 29) is shown in the future condition analysis in Section 3.9 Hydrology and Water Quality (refer to Figure 3.9-7 through Figure 3.9-9). The cumulative impact of the proposed project and cumulative projects on flooding would be beneficial and no adverse cumulative impact would occur.

Water Quality, Erosion, and Sedimentation

The proposed project and cumulative projects that involve greater than 1 acre in surface disturbance are required to comply with the Construction General Permit and prepare and implement a project-specific SWPPP and sediment and erosion-control BMPs. Construction of the proposed project and cumulative projects would not result in a significant cumulative impact on water quality, erosion, or sedimentation.

In combination with other projects that alter structures in the Corte Madera Creek channel, in particular the flood-risk reduction projects, the proposed project could alter erosion and sediment deposition processes. The cumulative impact from implementation of the proposed project and cumulative flood-risk reduction projects in Ross Valley are shown in Figure 3.9-7 through Figure 3.9-9. As discussed in Impact 3.9-2 in Section 3.9 Hydrology and Water Quality, the bank and bed stability and channel widening project elements would result in a cumulative beneficial erosion and siltation impact. Because the analysis in Section 3.9 addresses future conditions with implementation of cumulative projects, the analysis also addresses the cumulative impact. As demonstrated in Section 3.9, the cumulative impact would be less than significant.

Groundwater

The project would only require very localized dewatering of groundwater during excavation of the fish pools and the lower Corte Madera Creek concrete-channel removal. The dewatering would be highly localized at each area of excavation and would only last a few weeks. Due to the short duration and limited amount of water that could be removed by the project, there is

no potential for cumulative groundwater impacts because no cumulative project would require dewatering in proximity to the proposed project at the same time.

4.4.10 Noise

Geographic Scope

The geographic context for cumulative noise and vibration impacts includes projects within 1,000 feet of the proposed project. Projects located at distances greater than 1,000 feet from the proposed project would not generate noise levels that would be considerable in combination with anticipated project noise. Vibration dissipates rapidly with distance. The geographic scope of analysis for vibration is 100 feet.

Cumulative Projects

The Access Ramp to Corte Madera Creek (#1), the Cedar Tentative Map (#11), the Lower Corte Madera Creek Improvement Study (#21), Corte Madera Creek Project Phase II (#23), and Sir Francis Drake Boulevard Rehabilitation Project (#24) are located within 1,000 feet of portions of the project.

Cumulative Impacts

Impacts Avoided

As described under Section 3.10 Noise, the project would have no impact related to exposing people to excess noise due to proximity to an airport or private airstrip. Because the project area would not involve locating people near or increasing use of an airport or private airstrip, there would be no significant cumulative noise impacts to which the project would contribute.

Noise and Vibration

The proposed project and cumulative projects would only generate substantial noise and vibration during the construction phase. Cumulative noise and vibration impacts would, therefore, only occur if the proposed project and cumulative projects within 1,000 feet of the proposed project were constructed at the same time. The access ramp to Corte Madera Creek and Sir Francis Drake Boulevard Rehabilitation would be constructed prior to the proposed project. The Cedar Tentative Map would subdivide a parcel but would not result in any new noise or vibration. The remaining cumulative projects are in very early planning and design phases and would be constructed after the proposed project. Cumulative noise and vibration impacts would not occur because none of the cumulative projects would be constructed in proximity to the proposed project at the same time as the proposed project.

4.4.11 Public Services

Geographic Scope

The geographic scope of analysis for public services includes the Town of Ross and unincorporated Marin County, which provide public services to the project area.

Cumulative Projects

One of the projects identified in Table 4.3-1 would be under construction at the same time as the project (Winship Avenue Bridge Replacement Project).

Cumulative Impacts

Demand for Public Services

Incidents could occur during construction requiring law enforcement, fire protection, or emergency medical services. As discussed in Section 3.11 Public Services, Impact 3.11-1, construction of the flood-risk reduction project is not expected to increase demand for law enforcement, fire protection, and emergency medical services. In addition, the project construction would be temporary and would not generate additional permanent employees or residents in the project area; therefore, the project would not require the construction of new or physically altered governmental facilities that are not already planned. The project in combination with other projects would have less than significant cumulative impacts related to public services.

Maintenance of Public Facilities Including Roads

The project and cumulative projects would result in temporary increase in truck traffic on Sir Francis Drake Boulevard during construction. Sir Francis Drake Boulevard is currently undergoing pavement rehabilitation. The proposed project and cumulative project truck traffic would be within the design standards for Sir Francis Drake Boulevard. The cumulative impacts on maintenance of public roads would be less than significant.

4.4.12 Recreation

Geographic Scope

The geographic scope of analysis for recreation includes the parks, trails, and bikeways affected by the proposed project.

Cumulative Projects

Cumulative projects that could affect the same parks, bikeways, and trails as the proposed project include the following:

- Lower Corte Madera Creek Improvement Study (#21)
- Corte Madera Creek Project Phase II (#23)
- North-South Greenway Gap Closure Project (#25)

Cumulative Impacts

Impacts Avoided

Construction and operation of the project would not require the designation of additional park land to remain in conformance with locally acceptable or adopted park standards. Therefore, there would be no significant cumulative impact on these resources to which the project would contribute.

Construction of Recreational Facilities
The proposed project and North-South Gap Closure Project would require construction of segments of Bike Route 20. The North-South Gap Closure Project is located over 1 mile from the proposed project and would not result in cumulative impacts from construction and modification of Bike Route 20. Cumulative impacts would not occur.

The Lower Corte Madera Creek Improvement Study and Corte Madera Creek Project Phase II projects could require modifications to Bike Route 20 to allow for the floodplain improvements. Both projects are in early-phase planning and design, and the impacts on Bike Route 20 from either project would be speculative and would occur after the projects were constructed. Cumulative impacts would not occur.

Impacts on Recreational Opportunities
Construction of the proposed project and North-South Greenway Gap Closure Project could occur in 2022. The proposed project's temporary closure of Bike Route 20 and North-South Greenway Gap Closure Project are separated by over 2 miles, and each project would be able to detour bicyclist traffic during construction without affecting the other project. A cumulative adverse impact on recreational opportunities would not occur.

4.4.13 Transportation and Traffic

Geographic Scope
The geographic scope for transportation and traffic impacts includes the roadways that would be used to access the proposed project during construction.

Cumulative Projects
All of the cumulative projects in Table 4.3-1 would require access on Sir Francis Drake Boulevard.

Cumulative Impacts

Conflict with Program, Plan, Ordinance, or Policy Addressing the Circulation System
The Congestion Management Program (CMP) for Sir Francis Drake Boulevard was prepared to address cumulative traffic impacts on Sir Francis Drake Boulevard. The threshold for analysis of cumulative impacts includes generation of greater than 100 vehicle trips during peak hours. As discussed in Section 3.13, Impact 3.13-1, the proposed project would generate an average of 94 trips per day and less than the 100-trips-per-peak-hour CMP threshold. The project would not contribute considerably to a significant cumulative traffic impact on Sir Francis Drake.

Conflict with CEQA Guidelines 15064.3(b)
CEQA Guidelines Section 15064.3 (b), which requires evaluation of vehicle miles traveled, is a cumulative impact analysis by nature and is intended to address new cumulative traffic generated by development. The project-level threshold for evaluating a significant vehicle-miles-traveled impact is therefore the same as the cumulative threshold. As discussed in Section 3.13, Impact 3.13-2, the project construction would generate less than the significance

threshold used for new development. The project would not contribute considerably to a significant vehicle-miles-traveled impact.

Traffic Hazards and Emergency Access
The project would require detours of bicycle and pedestrian traffic during construction. The project would also require very short-term lane closures at College Avenue and Laurel Avenue. The temporary detours and lane closures would not coincide with any other cumulative project construction that would be occurring in the area. No cumulative impact on traffic hazards or emergency access would occur.

4.4.14 Utilities and Service Systems

Geographic Scope
The geographic scope of analysis for utilities and service systems is the region served by the same utility and service providers.

Cumulative Projects
All of the projects in Table 4.3-1 are located in the same utility service area as the proposed project.

Cumulative Impacts

Relocation or Construction of Utilities
As discussed in Section 3.15 Utilities and Service Systems, Impact 3.15-1, the project would not require the construction of new facilities for water or wastewater or require the relocation of any facilities. The project would require a temporary tap to a PG&E electrical line at the stormwater pump station. The temporary tap is not located in proximity to any cumulative projects, and the very limited use of electricity when the pump station is operating would not result in a significant cumulative impact that could cause expansion of any electrical utilities. The cumulative impact would be less than significant.

Sufficient Water Supplies, Wastewater Treatment, and Landfill Capacity
The analysis of water, wastewater, and landfill capacity is by its very nature a cumulative impact analysis because it requires consideration of the capacity of the water supply, wastewater supply, and landfills to adequately serve existing and proposed uses. As described in Section 3.15 Utilities and Service System, project construction would have short-term and less-than-significant impacts on water supplies, wastewater, and landfill capacity. Operation and maintenance activities would not create long-term requirements for additional water, waste water, or landfill capacity. Therefore, the project would not cause a significant cumulative impact on these resources.

4.4.15 Forestry Resources

Geographic Scope

The geographic scope for the analysis of potential cumulative forestry resources impacts includes the Corte Madera Creek watershed.

Cumulative Projects

Several of the cumulative projects will require removal of trees, including the following:

- San Anselmo Creek flood control – nursery basin site (#3)
- Hillview pump station and stormdrain (#5)
- Brownridge tree removal (#12)
- Cooney tree removal (#14)
- Real Equity tree removal (#20)
- Lower Sleepy Hollow Creek Improvements (#22)
- Corte Madera Creek Project Phase II (#23)

Cumulative Impact

The cumulative projects identified in Table 4.3-1 are required to obtain a permit from Marin County or other local jurisdictions for removal of trees greater than 6 inches diameter at breast height. The County and local tree permits require replacement plantings for trees that will be removed by the cumulative projects. Compliance with the mitigation included in each project's tree removal permit will result in replacement of trees removed by cumulative projects. The cumulative projects in combination with the proposed project would not result in a cumulative impact on forestry resources because each of the cumulative projects would provide mitigation to offset the trees removed. The cumulative impact would be less than significant. Land Use and Planning

Geographic Scope

The geographic scope of land use and planning impacts includes the Town of Ross and unincorporated Kentfield areas.

Cumulative Projects

Cumulative projects located within the geographic scope of analysis include the Winship Avenue Bridge Replacement Project (#6), the access ramp to Corte Madera Creek (#1), a number of minor structures, tree removal, and land-use modifications (projects #7 #8, #9, #10, #11, #12, #13, #15, #17, #19, and #20), and the Marin Health Care District.

Cumulative Impacts

Impacts Avoided

The project would not cause a significant environmental impact due to a conflict with a land use plan or regulation adopted for the propose of avoiding or mitigating an environmental effect and would, therefore, not cause a significant cumulative impact.

Physically Divide a Community
Neither the proposed project nor any cumulative project proposes any infrastructure that would physically divide a community. A significant cumulative impact would not occur.

Substantial Alteration of the Character of the Community
The reduction in canopy cover at Frederick Allen Park would result in a temporary reduction of the urban forest and visual separation from private properties on Sir Francis Drake Boulevard. No cumulative projects are proposed within Frederick Allen Park or the immediate surroundings. The cumulative projects would not affect the character of the park and surrounding residential areas. No cumulative impacts on the character of the community would occur.

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5 Alternatives

5.1 Introduction

This chapter presents descriptions and evaluations of alternatives to the Corte Madera Creek Flood Risk Management Project, Phase 1 (project) (including the required No Project Alternative), describes the alternatives screening process and alternatives eliminated from consideration, compares the environmental merits of the alternatives, and identifies the environmentally superior alternative.

Section 15126.6(a) of the California Environmental Quality Act (CEQA) Guidelines states that an EIR must describe and evaluate a reasonable range of alternatives to the proposed project that would feasibly attain most of the project's basic objectives but would avoid or substantially lessen any identified significant adverse environmental effects of the proposed project. Specifically, the CEQA Guidelines (Section 15126.6) set forth the following criteria for selecting and evaluating alternatives:

1. **Identifying Alternatives.** The selection of alternatives is to focus on identifying those alternatives that would avoid or substantially lessen any of the significant effects of the project, are feasible, and would attain most of the basic objectives of the project. Factors that may be considered when addressing the feasibility of an alternative include site suitability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, economic viability, and whether the proponent can reasonably acquire, control, or otherwise have access to an alternative site. An Environmental Impact Report (EIR) need not consider an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. The specific alternative of "No Project" also must be evaluated. The "No Project" analysis is to discuss existing conditions at the time the environmental analysis is begun, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved.
2. **Range of Alternatives.** An EIR need not consider every conceivable alternative but must consider and discuss a reasonable range of feasible alternatives in a manner that will foster informed decision-making and public participation. The "rule of reason" governs the selection and consideration of EIR alternatives, requiring that an EIR set forth only those alternatives necessary to permit a reasoned choice. The lead agency (Marin County Flood Control and Water Conservation District [District]) is responsible for selecting a range of project

alternatives to be examined and for disclosing its reasons for the selection of the alternatives.

3. **Evaluation of Alternatives.** An EIR is required to include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. Matrices may be used to display the major characteristics and environmental effects of each alternative. If an alternative would cause one or more significant effects that would not result from the project as proposed, the significant effects of the alternative must be discussed, but in less detail than the significant effects of the proposed project.

5.2 Approach to Alternatives Selection

5.2.1 Overview of Selection Process

Consistent with CEQA (Public Resources Code, Section 15004[b][1]), the District incorporated consideration of environmental impacts as well as environmental benefits into conceptualization, planning, and design for the project. The process for selecting alternatives to be evaluated in the EIR included gathering public input on potential alternatives to consider and defining alternatives to reduce environmental impacts during project planning and the preparation of this EIR, screening alternatives against CEQA alternatives screening criteria, and evaluating whether to retain each alternative for analysis in the EIR. The alternatives retained for analysis in this EIR are presented in Section 5.3. A comparison of these alternatives against the project is presented in Section 5.4.

5.2.2 Alternatives Considered during Project Planning

The alternatives considered during the project planning process included:

- alternatives evaluated in the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR), prepared by U.S. Army Corps of Engineers (USACE) in 2018;
- alternatives that were suggested in comments submitted during the public review period of the Draft EIS/EIR, prepared by USACE in 2018;
- alternatives developed by the District through evaluation of significant environmental impacts; and
- alternatives suggested by the public during the 2020 EIR scoping process.

5.2.3 Alternatives Screening Methodology

Screening Methodology

The alternatives that were considered during project planning were evaluated using a screening process consisting of three steps:

Step 1: Clearly define each alternative to allow comparative evaluation.

Step 2: Evaluate each alternative in comparison with the project using CEQA criteria (defined below)

Step 3: Based on the results of Step 2, determine the suitability of each alternative for full analysis in the EIR. If the alternative is unsuitable, eliminate it from further consideration.

CEQA Requirements for Alternatives

CEQA provides guidance on selecting a reasonable range of alternatives for evaluation in an EIR. This alternatives screening and evaluation process satisfies CEQA requirements. The CEQA requirements for selection of alternatives are described next.

An important aspect of EIR preparation is identification and assessment of a reasonable range of alternatives that have the potential for avoiding or minimizing the impacts of a project (CEQA Guidelines, Section 15126.6[d]). The CEQA Guidelines also require consideration of the No Project Alternative (Section 15126.6[e]). The EIR must adequately assess these alternatives to allow a comparative analysis for consideration by decision makers. Section 15126.6(a) of the CEQA Guidelines state that:

> An EIR shall describe a reasonable range of alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. 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.

To comply with CEQA requirements, each alternative that has been suggested or developed for the project has been evaluated in three ways:

1. Does the alternative accomplish all or most of the project objectives?
2. Is the alternative potentially feasible (from economic, environmental, legal, social, and technological standpoints)?
3. Does the alternative avoid or substantially lessen any significant effects of the project (including consideration of whether the alternative itself could create significant environmental effects potentially greater than those of the project)?

Each of these criteria is described in more detail in the following sections.

Project Goals and Objectives

The primary goals of the project are to reduce the frequency and severity of flooding, and to protect human life and property in the communities of Ross and Kentfield by enhancing and improving Corte Madera Creek. The District has defined the following six project objectives:

1. **Flood Risk Reduction.** Reduce overall flood inundation extent and depth in the Town of Ross and Kentfield area.

2. **Environmental Benefits.** Improve fish passage, natural creek processes, and fish and riparian habitats adjacent to the creek.
3. **Public Access and Enhanced Recreational Experience.** Maintain public access along the creek via the multi-use path and enhance the recreational experience and amenities along the creek corridor to meet the Town of Ross and Kentfield area community needs.
4. **Operational Reliability.** Improve operational reliability and reduce long-term maintenance costs by increasing maintenance access, improving channel stability, and protecting existing utilities.
5. **Regulatory Compliance.** Comply with local, State, and federal environmental laws and regulations.
6. **Fiscally Responsible Flood Risk Reduction.** Implement a flood risk reduction project that can be accomplished with currently available local and grant funding and reasonably foreseeable grant funding opportunities.

The CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives" (Section 15126.6[b]). Therefore, CEQA does not require that each alternative meet all the project objectives identified above. The determination of whether to eliminate or retain alternatives in the EIR was based on each alternative's ability to adequately meet most of the project objectives, as defined by the District. Each alternative that met four or more of the six project objectives was moved forward to screen for feasibility.

Feasibility

Section 15364 of the CEQA Guidelines define feasibility as "...capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." The alternatives screening analysis mainly is governed by what CEQA terms the "rule of reason," meaning that the analysis should remain focused not on every possible eventuality but rather on the alternatives necessary to permit a reasoned choice. Alternatives that are potentially feasible, while still meeting most project objectives, are to be fully analyzed in the EIR if they also reduce a project's environmental impacts.

According to Section 15126.6(f)(1) of the CEQA Guidelines, the factors that may be considered when addressing the potential feasibility of alternatives include site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or other regulatory limitations, jurisdictional boundaries, and the project proponent's control over alternative sites. For the screening analysis, the potential feasibility of alternatives was assessed by considering the following factors:

- **Legal Feasibility.** Would the alternative have the potential to avoid land with uses having legal protection that may prohibit or substantially limit the feasibility of permitting channel improvements? Land use afforded legal protections that would prohibit project construction or would require an act of Congress for permitting is

considered to be a less feasible location for the project. Such land use designations include wilderness areas, wilderness study areas, restricted military bases, airports, and Native American reservations.

- **Regulatory Feasibility.** Would regulatory restrictions substantially limit the likelihood of successful permitting of a high-voltage transmission line? Is the alternative consistent with regulatory standards for transmission system design, operation, and maintenance?
- **Technical Feasibility.** Would the alternative be potentially feasible from a technological perspective, considering available technology? Would any construction, operation, or maintenance constraints be likely to occur that could not be overcome?
- **Economic Feasibility.** Would the alternative be so costly that its implementation would be prohibitive? Section 15126.6(b) of the CEQA Guidelines requires consideration of alternatives capable of eliminating or reducing significant environmental effects, although they may "impede to some degree the attainment of the project objectives, or would be more costly." In 1988, the Court of Appeals determined in Citizens of Goleta Valley v. Board of Supervisors: ". . .The fact that an alternative may be more expensive or less profitable is not sufficient to show that the alternative is financially infeasible. What is required is evidence that the additional costs or lost profitability would be severe enough to render it impractical to proceed with the project."
- **Environmental Feasibility.** Would implementation of the alternative cause substantially greater environmental damage than the project, thereby making the alternative clearly inferior from an environmental standpoint? Would the alternative reduce any potentially significant project impact? This issue primarily is to be addressed in terms of the alternative's potential to eliminate potentially significant project effects.

Potential to Eliminate Significant Environmental Effects

A key CEQA requirement for an alternative is that it must have the potential to "avoid or substantially lessen any of the significant effects of the project" (CEQA Guidelines, Section 15126.6[a]). At the screening stage, evaluating or quantifying all the impacts of the alternatives in comparison to the project would not be possible. However, identifying elements of an alternative that are likely to be the sources of impacts and relating them, to the extent possible, to general conditions in the project area would be possible.

The project's potentially significant environmental impacts were identified and evaluated to develop alternatives and determine whether an alternative would meet the CEQA Section 15126.6 requirements. The potentially significant impacts of the project are described in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, of the EIR and include visual quality. The project would result in a substantial change in visual quality at Frederick Allen Park during tree growth and establishment.

Furthermore, the project would have the potential to result in additional significant impacts on aesthetics, air quality, biological resources, cultural resources, geology and soils, hydrology and water quality, noise, recreation, and transportation, but these impacts would be reduced to less than significant after implementing mitigation. The analysis in Chapter 3 of the EIR show that project impacts on visual quality would be significant and unavoidable, even after incorporating mitigation.

5.2.4 Selecting Alternatives for Analysis in the EIR

Each of the alternatives considered during project planning and preparation of the EIR are identified in Table 5.2-1, showing a summary of each alternative's ability to meet the basic project objectives and feasibility criteria. The alternatives retained for further consideration and analysis and the No Project Alternative are described in Section 5.3. The alternatives eliminated from further consideration are described in Section 5.3, along with the rationale for their elimination.

Table 5.2-1 Alternatives Screening Results

Description of Alternative	Meets Most Objectives?	Meets Feasibility Criteria?	Avoids/Reduces Environmental Effects?	Conclusion
Alternatives Retained				
Alternative 1: Reduced Footprint–Avoid Frederick Allen Park Alternative 1 would avoid the concrete channel removal and floodplain construction in Frederick Allen Park. The concrete channel in the park would remain, and four larger fish resting pools would be constructed within the concrete channel adjacent to the park, to improve fish passage within the Frederick Allen Park reach of Unit 3. Alternative 1 would incorporate and would not modify all remaining project elements in Unit 4, including removal of the fish ladder, all project elements in lower Unit 3, and all project elements in Unit 2. *Sources: Town of Ross, scoping comments*	**Yes.** This alternative would meet most project objectives. It would partially meet Objective 1 and would provide flood risk reduction, as demonstrated in the analysis below; however, the flood reduction would be less than the proposed project. It would partially meet Objective 2 because it would improve fish passage, but to a lesser extent than the project, and it would not enhance natural creek processes or include riparian habitat creation. It would partially meet Objective 3 by maintaining the existing public access, but it would not enhance the recreational opportunity. It would partially meet Objective 4 by protecting existing utilities, but it would not improve operational reliability or reduce long-term maintenance of the concrete channel. It would meet Objectives 5 and 6 because it would comply with relevant laws and regulations and could be accomplished with local and reasonably foreseeable grant funding.	**Yes.** This alternative meets the feasibility criteria. It would include installation of four fish pools that would be like other fish pools that would be installed as part of the project. It would be technically feasible to construct, like the fish pools that would be constructed in lower Unit 3. With the additional fish pools in the concrete channel, this alternative still would achieve fish passage improvement, although the improvement would be less than that of the proposed project. Therefore, the alternative would meet regulatory feasibility criteria. It would avoid land uses with legal protection, which would make it legally feasible. The alternative would be less costly than the proposed project and would meet economic feasibility criteria.	**Yes.** This alternative would avoid the temporary significant impacts on visual quality from removal of trees at Frederick Allen Park. It also would avoid temporary biological, noise, traffic, and recreational impacts by avoiding construction in the park area. It would not result in any increased or new significant environmental impacts, in comparison to the project.	**Retained.** This alternative has been retained for detailed analysis because it would meet most objectives, would be feasible, and would avoid the potentially significant project impacts.
Alternative 2: Boardwalk in Frederick Allen Park Alternative 2 would involve constructing Bike Route 20 on a boardwalk attached to the short new floodwall at the west edge of Frederick Allen Park. The boardwalk bike path would be elevated above the floodplain and would not be subject to increased flooding risk. The alternative would not create new public access to the creek but would include a new maintenance accessway parallel to the creek, to accommodate maintenance of the riparian habitat and floodplain. It would incorporate and would not modify any of the remaining project elements in Unit 4, the floodplain construction, floodwalls, and retaining walls in Frederick Allen Park, and lower Unit 3, and Unit 2. *Sources: District, scoping comments*	**Yes.** This alternative would meet all project objectives. It would meet Objective 1 and provide flood control benefits comparable to the project, because the floodplain at Frederick Allen Park and all remaining project elements still would be constructed. It would meet Objective 2, because it would improve fish passage, enhance natural creek processes, and create riparian habitat comparable to the project. It would meet Objective 3 by maintaining public access and enhancing recreational opportunities, by construction of a new boardwalk and overlook in the riparian and creek habitat. It would meet Objective 4 by protecting existing utilities and increasing operational reliability, comparable to the proposed project. It would meet Objectives 5 and 6, because it would comply with relevant laws and regulations and could be accomplished with local and reasonably foreseeable grant funding.	**Yes.** The boardwalk at Frederick Allen Park would meet all feasibility criteria. The boardwalk adjacent to the floodwall and unpaved maintenance access path would be technically feasible to construct. The alternative still would include the concrete channel removal and creation of natural riparian habitat that would meet regulatory requirements. The pathway adjacent to the floodwall would avoid trees adjacent to the floodwall and would meet Section 408 requirements for tree setback from the floodwall. The alternative would be in Frederick Allen Park and would require Town of Ross approval for construction of the boardwalk on Town property. It would meet legally feasibility criteria, like the proposed project. It would involve construction of a boardwalk multi-use path instead of a paved multi-use path. The difference in cost between the paved path and boardwalk would be minimal, and the alternative would be economically feasible.	**Yes.** This alternative would avoid impacts from increased flooding of the multi-use pathway in Frederick Allen Park, by locating the pathway at a higher elevation above the floodplain. It also would avoid the less-than-significant impacts associated with increased pedestrian access to the creek and would accommodate increased planting in the floodplain, by allowing planting below the boardwalk. It would not result in any increased or new significant environmental impacts, in comparison to the project.	**Retained.** The alternative has been retained for detailed analysis because it would meet all project objectives, would be feasible, and would avoid project impacts.
Alternative 3: Reduced Concrete and Increased Natural Materials Alternative 3 would reduce the use of concrete in the project by implementing the following modifications: 1. Replacement of the concrete transition from Unit 4 to Frederick Allen Park with large rock to protect the Ross Valley Sanitary District (RVSD) pipeline.	**Yes.** This alternative would meet all project objectives. It would meet Objective 1 and provide flood control benefits comparable to the project because all project elements would be constructed; however, some of the elements would be constructed with materials other than concrete. It would meet Objective 2 because it would improve fish passage, enhance natural creek processes, and create riparian habitat comparable to the project. It would meet Objective 3 by maintaining public access and enhancing recreational opportunities comparable to the project. It	**Yes.** Preliminary analysis indicates this alternative would meet all feasibility criteria. Use of non-concrete retaining walls and non-concrete protection for buried pipelines has been feasible in other locations. Additional engineering would be required to determine the feasibility of the alternative elements in the project setting. The alternative presumably would meet regulatory feasibility criteria because the riparian corridor and fish passage improvements associated with the project still would remain. USACE may determine	**Yes.** This alternative would not avoid impacts from use of concrete in Corte Madera Creek and the floodplain. The alternative would not be likely to result in any new or increased significant impacts and could result in long-term benefits for fish and wildlife, resulting from reduced concrete and increased use of natural materials.	**Retained.** This alternative has been retained for detailed analysis because it would meet most project objectives, would be feasible, and would not result in any increase in environmental impacts.

Description of Alternative	Meets Most Objectives?	Meets Feasibility Criteria?	Avoids/Reduces Environmental Effects?	Conclusion
2. Construction of the retaining walls in Unit 4 and Unit 3 with rock or a material that would allow planting within the retaining walls. 3. Construction of the Unit 2 floodwall with rock instead of concrete. The alternative would not remove any elements of the project but would involve only replacing certain concrete elements with other materials. *Sources: District, scoping comments*	would meet Objective 4 by meeting the engineering criteria for protection of the RVSD sewer line. The operational reliability of the non-concrete elements has not been determined. The alternative would meet Objectives 5 and 6 because it would comply with relevant laws and regulations and could be accomplished with local and reasonably foreseeable grant funding.	that the non-concrete floodwall in Unit 2 is not a floodwall; however, this would be subject to additional evaluation. The alternative elements would be implemented on District property and would meet legal feasibility requirements. The alternative presumably would be similar in cost to the proposed project and would meet economic feasibility criteria.		
Alternatives Eliminated				
Alternative A: Top-of-Bank Floodwall Alternative A would construct top-of-bank floodwalls along the length of the creek in the project area. Setback floodwalls would be constructed around Kent Middle School athletic fields. *Source: 2018 EIS/EIR*	**Yes.** This alternative would meet most project objectives. It would partially meet Objective 3 by maintaining recreational access, but it would not include improvements to enhance the recreational experience in the creek corridor. Objective 6 would require achieving flood risk reduction using currently available local and reasonably foreseeable grant funding. The alternative could not be accomplished using existing and foreseeable funding because of the necessary real estate acquisitions.	**No.** This alternative is not feasible because of the time it would take to purchase 30 parcels and relocate residents living on purchased parcels. The project schedule could not accommodate the real estate acquisition duration. The project would not be legally feasible. In addition, USACE estimated that the cost to implement the alternative would be approximately $200 million, greatly exceeding the $14 million in funding that would be available for the project and not meeting economic feasibility criteria. Because parcels would require acquisition by the District, it may be legally infeasible to implement this alternative.	**No.** This alternative would have significant and unavoidable impacts on water quality, biological resources, aesthetics, noise, and land use. It would have substantially more impact than the project because of the additional activities upstream from Lagunitas Creek and downstream from Kent Middle School.	**Rejected.** The alternative would not meet legal and economic feasibility criteria and would not reduce environmental effects.
Alternative B: Top-of-Bank Floodwall/Partial Sylvan Lane Setback/College of Marin Widening Alternative B would replace the concrete channel lining around the College of Marin and Kent Middle School with an earthen channel, and box culverts would be installed under College Avenue. *Source: 2018 EIS/EIR*	**Yes.** This alternative would satisfy most project objectives. It would partially meet Objective 3 by maintaining recreational access, but it would not include improvements to enhance the recreational experience in the creek corridor. Objective 6 would require achieving flood risk reduction using currently available local and reasonably foreseeable grant funding. The alternative could not be accomplished using existing and foreseeable funding because of the need for substantial real estate acquisition, additional construction, and associated expense.	**No.** This alternative would not be feasible because of the time and cost it would take to purchase 18 parcels and relocate residents living on purchased parcels. USACE estimated the cost to implement this alternative would be $172.5 million, greatly exceeding the $14 million available to construct the project, and thus the alternative would not meet the economic feasibility criteria. Because the District does not own the land where the project would be located and substantial property acquisition would be required, the project also would not meet legal feasibility criteria.	**No.** This alternative would have significant and unavoidable impacts on water quality, biological resources, aesthetics, noise, and land use. It would have substantially more impact than the project because of the additional activities upstream from Lagunitas Creek and downstream from Kent Middle School.	**Rejected.** The alternative would not meet legal and economic feasibility criteria and would not reduce environmental effects.
Alternative C: Top-of-Bank Floodwall/Full Sylvan Lane Setback/College of Marin Widening Alternative C would construct a combination of top-of-bank and setback floodwalls. It would involve creek widening, a lowered bike path, and selected setback barriers at the College of Marin. *Source: 2018 EIS/EIR*	**Yes.** This alternative would satisfy most project objectives. It would meet or partially meet Objectives 1 through 5. It would not meet Objective 6, which would require achieving the project using currently available local and reasonably foreseeable grant funding. It could not be accomplished using existing and foreseeable funding because of the necessary real estate acquisitions and substantial additional construction expense.	**No.** This alternative would not be feasible because of the time it would take to purchase 18 parcels and relocate residents living on purchased parcels. It would not be legally feasible to acquire the 18 parcels within the project time frame. The alternative cost would be similar to Alternative B ($173 million), greatly exceeding the available funding, and in fact would be more expensive than Alternative B. Implementing the project with the funding that would be available for Phase I would not be economically feasible.	**No.** This alternative would have significant and unavoidable impacts on water quality, biological resources, aesthetics, noise, and land use. It would have substantially more impact than the project because of the additional activities upstream from Lagunitas Creek and downstream from Kent Middle School.	**Rejected.** The alternative would not meet legal or economic feasibility criteria and would not reduce environmental effects.

Description of Alternative	Meets Most Objectives?	Meets Feasibility Criteria?	Avoids/Reduces Environmental Effects?	Conclusion
Alternative F: Underpass/Allen Park Riparian Corridor/College of Marin Widening Alternative F would construct top-of-bank and setback floodwalls (maximum height of 9 feet) and an underpass under Sir Francis Drake Boulevard. It would make improvements to a recreation path in Frederick Allen Park. It would replace a concrete lining with an earthen channel in Unit 3 at the College of Marin. *Source: 2018 EIS/EIR*	**Yes.** This alternative would satisfy most project objectives. It would not meet Objective 6, which would require achieving the project using currently available local and reasonably foreseeable grant funding. It would exceed the funding available because it would include a substantial increase in construction to replace the concrete channel in Unit 3 at the College of Marin and add the underpass under Sir Francis Drake Boulevard.	**No**. This alternative would not be feasible because of the substantial funding required to construct the underpass under Sir Francis Drake Boulevard and remove the concrete channel in Unit 3 at the College of Marin, in addition to the project construction at Frederick Allen Park. The cost for this alternative would range from $37 million to $56 million, which would exceed the $14 million available for project construction.	**No.** This alternative would have significant and unavoidable impacts on water quality, noise, and traffic. It would have substantially more impact than the project because of the additional activities under Sir Francis Drake Boulevard and at the College of Marin.	**Rejected.** The alternative would not meet economic feasibility criteria and would not reduce environmental effects.
Alternative G: Floodwall/Allen Park Riparian Corridor/College of Marin Widening Alternative G would construct top-of-bank floodwalls (maximum height of 6 feet), make improvements to the recreation path in Frederick Allen Park, and replace the concrete lining with an earthen channel in Unit 3 at College of Marin. *Source: 2018 EIS/EIR*	**Yes.** This alternative would satisfy most project objectives. It would not meet Objective 6, which would require achieving flood risk reduction using currently available local and reasonably foreseeable grant funding. The alternative could not be accomplished using existing and foreseeable funding.	**No.** This alternative would not be feasible because of the time it would take to purchase 18 parcels and relocate residents living on purchased parcels. The acquisition of 18 parcels would not be legally feasible within the project's time frame. USACE estimates that the cost of this alternative would be $173 million, greatly exceeding the $14 million available for project construction. The alternative would not meet the economic feasibility criteria.	**No.** This alternative would have significant and unavoidable impacts on water quality, biological resources, aesthetics, noise, and land use. It would have substantially more impact than the project because of the additional activities at the College of Marin and related to acquisition of the 18 property parcels.	**Rejected.** The alternative would not meet legal or economic feasibility criteria and would not reduce environmental effects.
Alternative J: Underpass/Allen Park Riparian Corridor/Floodwall Alternative J would construct an underpass under Sir Francis Drake Boulevard and floodwalls in Frederick Allen Park near the Granton Park neighborhood, adjacent to College Avenue. *Source: 2018 EIS/EIR*	**Yes.** This alternative would satisfy five of the six project objectives. It would not meet Objective 6, which would require achieving flood risk reduction using currently available local and reasonably foreseeable grant funding. The alternative could not be accomplished using existing and foreseeable funding.	**No.** This alternative would result in additional cost to construct the underpass under Sir Francis Drake Boulevard in addition to all other proposed project elements. The additional cost of underpass construction to the proposed project elements would exceed the $14 million available for project construction. The alternative would not meet economic feasibility criteria.	**No.** This alternative would increase noise and traffic impacts because of construction of the underpass under Sir Francis Drake Boulevard. It would have substantially more impact than the project because of the additional activities under Sir Francis Drake Boulevard.	**Rejected.** The alternative would not meet economic feasibility criteria and would not reduce environmental effects.
Fish Ladder Removal Only This alternative would remove only the fish ladder in Unit 4 and would include no other proposed project elements. This alternative is similar to Alternative 1 in that Alternative 1 does not modify Frederick Allen Park. This alternative differs from Alternative 1 because Alternative 1 includes proposed flood control and habitat elements in Unit 4 and Kentfield areas. Alternative 1 also includes 4 larger fish pools in the existing concrete channel adjacent to Frederick Allen Park. *Source: scoping comments*	**No.** This alternative would not meet most project objectives. Removal of the fish ladder in the absence of all other project components would not meet Objective 1, because the floodwalls in Units 2 and 3 and the stormwater pump station would not be constructed. Flooding in Kentfield would continue and would be worsened by the alternative. The alternative would not improve fish passage and would not meet Objective 2 because none of the fish resting pools would be constructed, and the gap in fish passage in the concrete channel would remain. The alternative would retain existing public access and would partially meet Objective 3 for public access. It would leave the RVSD pipeline at risk and would not provide adequate transition between Unit 3 and Unit 4; therefore, it could undermine the integrity of the existing concrete channel and would not meet Objective 4. It would not meet Objective 5 because it would not comply with the regulatory criteria, it would affect the stability of the USACE flood control	**No**. This alternative would not be technically feasible because removal of the fish ladder in the absence of other hydrologic modifications would create hydrologic instability in Corte Madera Creek and could cause scour at the transition to the concrete channel. USACE would not approve removal of the fish ladder in the absence of a transition to Unit 3. Natural resource agencies would not approve the fish ladder removal in the absence of other fish passage and habitat improvements; therefore, the alternative would not meet regulatory requirements. The alternative could be completed with the available funds, would occur on District-owned land, and could meet economic and legal feasibility criteria.	**No.** This alternative would result in significant hydrologic impacts because it would not provide protection for Kentfield, leading to increased flooding in Units 3 and 2. It also would cause increased scour and hydrologic impacts on the transition to Unit 3, which would cause significant utility impacts. Although the alternative would avoid the project impacts on visual quality and recreational opportunity, it would result in long-term significant impacts on flooding and hydrology.	**Rejected.** This alternative would not meet most project objectives, would not meet regulatory requirements, and would result in a significant increase in hydrologic effects that would outweigh the benefits of the alternative.

Description of Alternative	Meets Most Objectives?	Meets Feasibility Criteria?	Avoids/Reduces Environmental Effects?	Conclusion
	channel, and it would not provide any improvement to fish passage or riparian habitat. The alternative would meet Objective 6 because it could be accomplished with the available funding.			
All Fish Resting Pools Improvement This alternative would include improving all 28 resting pools to address fish passage in Unit 3. It would replace the proposed project construction of 11 fish resting pools in Unit 3 but would not modify any other project elements. *Source: CDFW scoping comment*	**Yes.** This alternative would meet the proposed project objectives. The additional fish pools would provide fish resting habitat, comparable to the fish pools proposed as part of the project. The alternative would not meet Objective 6 because it could not be accomplished with currently available local or reasonably foreseeable funding.	**No.** Construction of larger fish pools in the concrete channel would be technically and legally feasible and would be part of the project. The alternative is expected to meet regulatory requirements and was suggested by CDFW. The cost of enlargement of 28 fish pools in Unit 3 (more than double the number proposed) would exceed the funding available for construction of fish resting pools and would not meet economic feasibility criteria.	**No.** This alternative would not avoid or reduce any project impacts and would not increase benefits for fish passage. The proposed fish passage resting pools were selected optimally to provide improvement to fish passage in Corte Madera Creek based on the 2020 study and evaluation prepared by Mike Love & Associates. The additional fish pools would result in additional construction impacts on hydrology in Corte Madera Creek and would lengthen the construction schedule.	**Rejected.** This alternative would not be economically feasible and would increase environmental effects.
Concrete Channel Removal in Units 2 and 3 This alternative would remove the concrete channel in Units 2 and 3 and would minimize floodwall construction that could result in permanent loss of riparian vegetation. The alternative would maximize concrete removal and channel naturalization. *Source: RWQCB comments on 2018 Draft EIS/EIR; scoping comments*	**Yes.** The alternative potentially meets most project objectives. As part of the alternative, additional design would be required to evaluate approaches to address flood control and incorporate recreational access along the multi-use pathway in Units 2 and 3. The alternative would not meet Objective 6 because it could not be accomplished with currently available local or reasonably foreseeable funding.	**No.** Removing the concrete channel may be technically feasible but would require further design. Removing the additional concrete in Units 2 and 3 presumably would meet regulatory requirements and legal feasibility criteria. The alternative would require substantially more funding than currently is available to the District, and it would not meet economic feasibility criteria. The alternative is considered as a separate and cumulative project in Chapter 4. The alternative could be implemented as a separate project in the future if sufficient funding to implement the alternative becomes available.	**No.** This alternative would not avoid or reduce any significant project impacts. It would involve concrete removal in new areas and would result in potentially significant impacts associated with construction in new areas. Additional environmental documentation would be needed before additional concrete channel removal in the lower Unit 3.	**Rejected**. This alternative would not be economically feasible and could not be accomplished within the project schedule. The alternative would also result in greater environmental impacts and would reduce impacts of the proposed project.
Sylvan Lane Flood Reduction–Winship Bridge to Lagunitas Bridge This alternative would include flood risk reduction in the Sylvan Lane area through flood control actions in the Winship Bridge to Lagunitas Bridge area of Corte Madera Creek. *Source: scoping comments*	**Yes.** This alternative would include project elements of the proposed project to meet Objectives 1 through 5. The alternative would add additional project elements upstream from Lagunitas Bridge, which could not be implemented with the available grant funding. It would not meet Objective 6 because it could not be accomplished with reasonably foreseeable grant funding.	**No.** This alternative would be potentially technically feasible but likely would require elements similar to the project, which would not be feasible (as discussed above). The alternative would not meet economic feasibility criteria because it would exceed available funding to add major elements to the proposed project. A separate project may be feasible in the future to address flooding in this area.	**No.** This alternative would require additional elements in other areas, which would not avoid or reduce the proposed project impacts and would result in greater impacts in new areas.	**Rejected.** This alternative would not meet economic feasibility criteria and would not reduce any environmental effects.
Buffer between the Retaining Walls and Corte Madera Creek in Frederick Allen Park This alternative either would remove the retaining walls at Frederick Allen Park or would set the retaining walls back from the creek to allow increased riparian plantings along the creek. *Source: CDFW scoping comment*	**No.** This alternative would not meet Objective 1 for flood risk reduction because a retaining wall would be required to provide flood protection for properties surrounding the project area. It would not meet Objective 3 for maintaining recreational access because moving the retaining wall would require removal of the bike path; the retaining wall is proposed in areas where the creek is adjacent to the bike path. It would not meet Objective 4 because it would not protect utilities that would be protected by the retaining wall and would not ensure operational reliability because the retaining wall is proposed to protect the creek at the transition from Unit 4 to Unit 3. In the absence of a retaining wall, the channel would be subject to	**No.** This alternative would not be technically feasible because the retaining wall would be required to protect existing infrastructure. If the retaining wall was removed, the infrastructure (including the bike path and adjacent structures) would not be sufficiently protected from the creek. Setting back the floodwall would require acquisition of residential and commercial properties, the cost of which would substantially exceed the available funding. Thus, the alternative would not be economically feasible.	**No.** This alternative would result in increased hydrologic impacts by removing the retaining wall, which would be needed for creek stability. It would not reduce any significant project impacts.	**Rejected.** This alternative would not meet the project objectives, would not be technically, legally, or economically feasible, and would result in increased flooding impacts without reducing any environmental effects.

Description of Alternative	Meets Most Objectives?	Meets Feasibility Criteria?	Avoids/Reduces Environmental Effects?	Conclusion
	substantial erosion at the transition. It also would not meet the objective for completing the project with available funding because relocating the retaining wall likely would require additional real estate acquisition of nearby properties.			
Stormwater Drainage under Kent Avenue This alternative would add stormwater drainage under Kent Avenue. *Source: scoping comments*	**Yes.** This alternative, in combination with the proposed project, would meet Objectives 1 through 5. The alternative would not meet Objective 6 because it would require additional elements that could not be accomplished with reasonably foreseeable grant funding.	**No.** This alternative is potentially technically feasible and could meet regulatory requirements and legal feasibility criteria. The alternative would require additional construction. Because this was suggested as an additional element that would be added to all other project elements, it would not be feasible to complete this work within the project budget and because the alternative was suggested as an addition, it is not an alternative to the project. Therefore, this alternative would not be economically feasible.	**No.** This alternative would result in new impacts along Kent Avenue and would not reduce any proposed project impacts because it would not avoid or replace any portion of the project.	**Rejected.** This alternative would not meet economic feasibility criteria and would not reduce environmental effects.

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5.3 Alternatives Selected for Analysis in the EIR

The alternatives selected for analysis in this EIR are:

1. No Project Alternative
2. Alternative 1: Reduced Footprint–Avoid Frederick Allen Park
3. Alternative 2: Boardwalk in Frederick Allen Park
4. Alternative 3: Reduced Concrete and Increased Natural Materials

To evaluate the various alternatives, the impacts of the proposed project within the "area of comparison" were compared to the impacts of the alternative, as described next, and summarized in Table 5.3-1, below. The "area of comparison" reflects the area of the proposed project that would be replaced by the alternative. The impacts of the proposed project would remain outside the area of comparison. The information contained in this Draft EIR will be reviewed and considered by the District Board of Supervisors before deciding to approve, disapprove, or modify the proposed project. As part of its deliberations, the Board of Supervisors will decide whether to approve all or part of the proposed project. The Board of Supervisors may adopt one or more of the alternatives, or parts of the alternatives described in this section, in lieu of the proposed project.

Table 5.3-1 Alternatives Areas of Comparison

Alternative	Proposed Project Area of Comparison	Difference from Proposed Project
Alternative 1: Reduced Footprint – Avoid Frederick Allen Park	• Construction in Corte Madera Creek and Frederick Allen Park between Unit 4 and Town of Ross jurisdictional limits • Limits of flooding upstream and downstream	• No modifications to Frederick Allen Park and Pathway • Four additional fish pools in the existing concrete channel • Modified transition from Unit 4 to Unit 3
Alternative 2: Boardwalk in Frederick Allen Park	• Bike Route 20 in Frederick Allen Park • Maintenance access at Frederick Allen Park	• Raised and realigned Bike Route 20 boardwalk path • No pedestrian creek access • New maintenance access parallel to creek
Alternative 3: Reduced Concrete and Increased Natural Materials	• Concrete in Corte Madera Creek at Unit 3 transition • Concrete retaining walls in Frederick Allen Park and Unit 4 • Concrete floodwall in Unit 2	• Non-concrete retaining walls in Unit 4 and Unit 3 • Non-concrete transition between Unit 3 and Unit 4 • Non-concrete floodwall in Unit 2

5.3.1 No Project Alternative

The CEQA Guidelines require an EIR to include an evaluation of the No Project Alternative, to provide decision-makers with the information necessary to compare the relative impacts of approving the project, or an alternative, and not approving the project (CEQA Guidelines Section 15126.6[e]). The No Project Alternative is defined as a continuation of existing conditions, as well as conditions that are reasonably expected to occur if the project is not implemented. The following discussion describes this alternative.

Description

The No Project Alternative represents the expected future condition if none of the action alternatives are approved and no change occurs in the current channel configuration. For the No Project Alternative, the current conditions and flood capacity would remain unchanged. The capacity ranges from 3,630 cubic feet per second (cfs) at Lagunitas Road Bridge in Unit 4 to greater than 6,900 cfs downstream of Unit 2 (USACE, 2010; Stetson Engineers, 2017). Under these existing conditions, flood flows exceeding these capacities would continue to pass outside the channel, onto the floodplain, and would continue to flood residential and commercial areas The Denil fish ladder would not be replaced, and fish passage would not be improved through Corte Madera Creek. Over time, the fish ladder likely would continue to degrade. Moreover, the transition point between the natural Unit 4 and concrete-lined Unit 3 stream reaches would remain a constricted section or a flood flow breakout zone. In Unit 2, the concrete channel below Stadium Way would remain, and marsh habitat that is resilient to climate change would not be established.

Environmental Impacts

The No Project Alternative would include maintaining the existing creek condition; baseline conditions would be maintained in the project area, and no new environmental impacts would be introduced. The cumulative flood control projects upstream from the project area still would occur. No improvement to fish passage, natural creek processes, or habitat would occur, nor would improvements to recreational facilities occur in the project area.

Aesthetics and Visual Resources

Implementation of the No Project Alternative would not affect the visual character of the project area because it would remain in its current condition. Views along Bike Path 20 in Frederick Allen Park and along Corte Madera Creek would remain unchanged. No impact would occur on aesthetics or visual resources.

The No Project Alternative would avoid the project's potentially significant impacts on visual quality from tree and vegetation removal and grading in Frederick Allen Park and the less--than-significant impact from the floodwalls and stormwater pump station in lower Unit 3 and Unit 2. The No Project Alternative also would not achieve the long-term benefit to aesthetics from creation of natural riparian habitats and a natural stream channel in Frederick Allen Park.

Air Quality

The No Project Alternative would not require vehicle or equipment use beyond the existing maintenance of the Corte Madera Creek channel. Criteria air pollutant emissions would not increase, and the risk to sensitive receptors would remain the same as baseline conditions. The ambient air quality of the project site would not be affected by the No Project Alternative. The No Project Alternative would avoid the air quality impacts resulting from project construction. The No Project Alternative would result in less than significant air quality impacts resulting from operation and maintenance of existing facilities, like operational impacts of the proposed project.

Biological Resources

The No Project Alternative would not require construction-related, ground-disturbing activities and would not affect special-status species that may occur in the project area. No impact would occur on existing jurisdictional waters or riparian habitat. The No Project Alternative could result in tree removal if USACE requires tree removal within 15 feet of the creek, which could result in an impact on existing trees and habitat.

The No Project Alternative would avoid the proposed projects' temporary construction impacts on special-status species, invasive species, riparian and sensitive habitats, and wetlands. The No Project Alternative also would reduce the amount of tree removal required, particularly in Frederick Allen Park.

The No Project Alternative would not modify the existing concrete channel, and the existing fish passage barriers and conditions would remain. The restoration of riparian and marsh habitat included in the proposed project would not occur under the No Project Alternative. The No Project Alternative would not achieve the long-term project benefits for fish passage, riparian habitat, and wetlands. The existing degraded habitat conditions in the project area would remain.

Cultural Resources

The No Project Alternative would not involve ground-disturbing activities, and thus no impacts would occur on archaeological resources or human remains. Furthermore, no impact would occur on cultural resources. The No Project Alternative would avoid the potential project impacts from inadvertent discovery and impact on cultural resources during project construction.

Energy

The No Project Alternative would not require the use of energy (fuel) resources for project construction. The No Project Alternative would avoid energy use from the stormwater pump station because no stormwater pump station would be constructed. The ongoing maintenance of the existing floodwalls and existing creek condition in the project area would require minimal energy resources, consistent with existing conditions. The No Project Alternative would avoid the proposed project's less-than-significant impact on consumption of energy resources during construction.

Geology and Soils

The No Project Alternative would not involve floodwall installation, concrete removal in Corte Madera Creek, or modifications to Frederick Allen Park, and would not expose structures or property to adverse effects from rupture of an earthquake fault, strong seismic ground shaking, seismic-related ground failure, liquefaction, landslides, or expansive or unstable soil. The No Project Alternative would not involve ground-disturbing activities that would result in loss of topsoil, but could involve tree removal, as stipulated by USACE. Soil erosion would continue at baseline conditions in the creek channel within Unit 4. No geologic, soils, or seismicity impacts would occur with the No Project Alternative. The No Project Alternative would not involve ground disturbance that could affect paleontological resources.

The No Project Alternative would avoid the proposed project's less-than-significant impacts related to geologic and seismic events, loss of topsoil and erosion, unstable geologic units, and expansive soils. The No Project Alternative would avoid the proposed project's less-than-significant impact on paleontological resources.

Under the No Project Alternative, the new streambank stabilization structures in Unit 4, riparian planting and streambank stabilization in Frederick Allen Park and salt marsh habitat in Unit 2 would not occur. The long-term improvements in streambank stabilization and structural reliability from the proposed project would not be achieved. The existing seismic risks to the concrete channel and erosion risks would remain.

Greenhouse Gas Emissions

The No Project Alternative would not involve floodwall installation, concrete removal in Corte Madera Creek, or modifications to Frederick Allen Park, and no construction-related greenhouse gas (GHG) emissions would be generated. Operational GHG emissions would occur from maintenance of existing facilities at the same rate as existing conditions.

The No Project Alternative would avoid the proposed project's impact on GHG resulting from use of off-road construction equipment and vehicles during project construction and would avoid GHG emissions from operation of the emergency generator and energy use at the stormwater pump station. The No Project Alternative would have minimal greenhouse gas emissions during maintenance of existing facilities, like the proposed project.

Hazards and Hazardous Materials

The No Project Alternative would not involve transportation or use of hazardous materials related to construction equipment use and would not emit hazardous emissions, resulting from construction, within 0.25 mile of an existing or proposed school. The No Project Alternative would not involve construction activities that could interfere with emergency response plans. Maintenance of the existing flood control channel under the No Project Alternative would involve limited quantities of hazardous materials.

The No Project Alternative would avoid the proposed project's less-than-significant impacts related to transportation and use of hazardous materials, emission of hazardous materials, and interference with emergency plans. The No Project Alternative would have less-than-significant

impacts related to hazardous materials' use during operation and maintenance of existing facilities, like to the proposed project.

Hydrology and Water Quality

The No Project Alternative would not involve ground-disturbing activities that would result in impacts on hydrology and water quality or construction activities that could result in the risk of pollutant release because of inundation. The No Project Alternative would not use groundwater, alter the existing drainage pattern of the project area, or change the amount of surface water or flow of water in Corte Madera Creek. Under the No Project Alternative, the destructive flooding that has occurred historically at Corte Madera Creek would continue to occur and would expose people and property to flooding and other water-related hazards. The cumulative flood control projects would provide some reduction in flooding in the town of Ross, but the ongoing flooding consequences in the Town of Ross and Kentfield area generally would remain.

The No Project Alternative would avoid the proposed project's potential water quality impacts from disturbance of potentially contaminated soils during construction. The No Project Alternative would avoid the minimal proposed project impact from increased flooding in the parking lot and field near the College of Marin Avenue. The No Project Alternative would not achieve the widespread proposed project benefits from reduction in flooding throughout the Town of Ross and Kentfield areas.

Noise

Under the No Project Alternative, project construction, including floodwalls, Frederick Allen Park modifications, and concrete channel removal, would not occur, and ambient noise levels in the project area would remain the same as existing conditions. The No Project Alternative would not result in changes to the ambient noise levels or cause vibration impacts.

The No Project Alternative would avoid the proposed project's potentially significant impacts related to an increase in ambient noise and groundborne vibration during construction. The noise impacts from maintenance of the channel would be less than significant and would be like the proposed project.

Public Services

The No Project Alternative would not cause a need for new or altered government facilities, including fire protection, police protection, schools, and parks. The No Project Alternative would not involve construction of proposed project components that could increase the need for fire or police services, and the alternative would not induce population growth and would not increase the need for new schools. The No Project Alternative would require maintenance of Corte Madera Creek, similar to existing conditions.

The No Project Alternative would avoid the proposed project's less-than-significant impacts on public services. The No Project Alternative would not achieve project benefits from improvements in stormwater drainage in the Kentfield Area, and the existing potential flooding impacts would remain.

Recreation
The No Project Alternative would not involve construction closures of Fredrick Allen Park, Bike Route 20, or the unnamed unofficial paths. The alternative would not include modifications to Frederick Allen Park or construction of an informal recreational path segment within Unit 2. The No Project Alternative would not increase the use of existing parks, include new recreational facilities, or affect existing recreational opportunities.

The No Project Alternative would avoid the proposed project impacts from increased flooding of the multi-use pathway in Frederick Allen Park and temporary loss of shade. The No Project Alternative also would avoid the less-than-significant impacts from a new access to the creek. The No Project Alternative would not have a beneficial impact on the recreational experience in Fredrick Allen Park, resulting from opportunities afforded through increased creek and habitat viewing.

Transportation and Circulation
Under the No Project Alternative, no construction-related transportation and traffic impacts would occur. Nearby roadways would not be used for construction-related traffic, and existing roads and/or recreational paths would not be used for access roads. The No Project Alternative would involve minimal vehicle miles traveled for maintenance of the existing flood control channel.

The No Project Alternative would avoid the proposed project's potentially significant, construction-related impacts on transportation and traffic, resulting from temporary closure of Bike Route 20 in Frederick Allen Park. The No Project Alternative would have a less-than-significant impact on transportation and circulation from vehicle miles traveled to maintain the flood control channel.

Tribal Cultural Resources
The No Project Alternative would not involve ground-disturbing activities, and no potential impacts on tribal cultural resources would occur. The No Project Alternative would avoid the proposed project's potential for inadvertent discovery of tribal cultural resources.

Utilities and Service Systems
The No Project Alternative would not require or result in relocation or construction of new water conveyance, wastewater treatment, and stormwater drainage, or the addition of electric power, natural gas, or telecommunications facilities. The No Project Alternative would not require water supplies because no project construction or operation would occur. Under the No Project Alternative, no wastewater or solid waste would be generated greater than existing conditions. The No Project Alternative would avoid the proposed project's less-than-significant impacts related to relocation or construction of water conveyance, wastewater treatment, and stormwater drainage; the addition of electric power, natural gas, or telecommunications facilities; additional water supply; or wastewater and solid waste generation.

Agriculture and Forestry, Land Use and Planning, Mineral Resources, Population and Housing, Socioeconomics, and Wildfire

The No Project Alternative would not involve impacts on lands containing agricultural or forestry resources or mineral resources. The No Project Alternative would not involve changes in land use or character of the community and would not conflict with the Town of Ross General Plan, Kentfield General Plan, or Marin Countywide Plan. The No Project Alternative would not induce unplanned population growth, and planned growth would continue as under existing conditions. The No Project Alternative would not involve any activities in areas that are very high fire hazard areas. The No Project Alternative would avoid the proposed project's less-than-significant impacts related to dividing an established community and unplanned population growth.

No Project Alternative Summary and Ability to Meet Objectives

Selection of the No Project Alternative would avoid the environmental impacts of the proposed project because no floodwalls, modifications to Frederick Allen Park, or concrete channel removal would occur. The baseline environmental conditions of the project area would remain under the No Project Alternative, including ongoing flooding consequences from Corte Madera Creek. The No Project Alternative would not meet any of the proposed project objectives.

5.3.2 Alternative 1: Reduced Footprint–Avoid Frederick Allen Park

Description

Alternative 1 would reduce the project footprint/area of disturbance by avoiding construction in Frederick Allen Park. The concrete channel would remain adjacent to Frederick Allen Park, and no construction would occur in the park. To meet the regulatory requirements and objectives for fish passage, four large fish pools would be constructed within the existing concrete channel adjacent to Frederick Allen Park, in addition to the large fish pools that are proposed as part of the project downstream in Unit 3. The fish ladder at the upstream end of Frederick Allen Park would still be removed in Alternative 1. No other modifications would occur to the concrete channel adjacent to Frederick Allen Park. Alternative 1 would include all proposed project elements as described in Chapter 2, except for the Frederick Allen Park enhancements in the Town of Ross. The Alternative 1 avoidance area and fish pools are shown in Figure 5.3-1.

Work within Unit 4, lower Unit 3, and Unit 2, including removal of the fish ladder, would be the same as the proposed project. Therefore, the following analysis focuses on construction impacts resulting from the four additional fish pools in Corte Madera Creek adjacent to Frederick Allen Park and avoidance of project modifications in Frederick Allen Park.

Figure 5.3-1 Alternative 1: Reduced Footprint–Avoid Frederick Allen Park



Source: (GHD, 2020)

Environmental Impacts

Aesthetics and Visual Resources

Alternative 1 Impacts

Alternative 1 would include four additional fish pools in the concrete channel in upper Unit 3. The addition of the fish pools would have no impact on scenic vistas because they would not be visible from publicly accessible scenic vistas. The fish pools would have a less-than-significant impact on the visual character of the project area because the Alternative 1 fish pools would be below grade in the concrete channel and would appear visually similar to existing fish pools in the channel. Alternative 1 would not conflict with adopted visual policies or standards and would not involve temporary construction lighting or permanent lighting.

Comparison of Impacts to the Proposed Project

Alternative 1 would avoid the proposed project's significant and unavoidable impact on visual quality in Frederick Allen Park immediately following construction and up to 10 years, while the proposed project landscaping matures. Alternative 1 would not achieve the long-term benefits to visual quality from establishment of a natural riparian corridor and stream channel with viewing opportunities. Alternative 1 would result in reduced impacts on visual quality, but also reduced benefits.

Air Quality

Alternative 1 Impacts

Alternative 1 would involve use of construction equipment and vehicles that would result in temporary construction emissions. The alternative would not require disturbance of soil and would not require mitigation. Construction of Alternative 1 in combination with the proposed project in Unit 4, lower Unit 3, and Unit 2 would result in exposure of nearby residents to toxic air contaminants in excess of thresholds set by the Bay Area Air Quality Management District (BAAQMD), as shown in Table 5.3-2. The District would implement Mitigation Measure 3.2-3, which would require use of U.S. Environmental Protection Agency (USEPA) or California Air Resources Board (CARB) Tier 3 off-road equipment. The impact would be less than significant with mitigation incorporated, as shown in Table 5.3-3. Maintenance of the four fish pools would not result in any increase in air quality emissions over existing conditions.

Comparison of Impacts to the Proposed Project

Alternative 1 would use the same types of construction equipment as the proposed project. Alternative 1 would require approximately 2 weeks for construction of the four fish pools but would not include the 105 days of construction in Frederick Allen Park. The duration of construction would be less than the proposed project and would result in decreased constructed-related emissions. Air quality impacts from maintenance of Alternative 1 would be comparable to the proposed project. Alternative 1 would result in a decrease in construction-related emissions and air quality impacts, compared to the proposed project.

Table 5.3-2 Alternative 1 Estimated Unmitigated Construction Health Risk

Receptor	Maximum Cancer Risk (in 1 million)	Chronic Hazard Index	Acute Hazard Index	Annual Average $PM_{2.5}$ Exhaust Concentrations ($\mu g/m^3$)
Maximally Exposed Individual Receptor[a]	15.9	0.037	0.17[b]	0.11
BAAQMD Significance Thresholds	10.0	1.0	1.0	0.30
Threshold Exceeded?	**Yes**	No	No	No

Notes:

[a] This receptor location is where the maximum health risk would occur based on modeling. No real-world sensitive receptors occur at this location.

[b] The maximally exposed individual receptor is a different location for the acute hazard index.

Table 5.3-3 Alternative 1 Estimated Mitigated Construction Health Risk

Receptor	Maximum Cancer Risk (in 1 million)	Chronic Hazard Index	Acute Hazard Index	Annual Average $PM_{2.5}$ Exhaust Concentrations ($\mu g/m^3$)
Maximally Exposed Individual Receptor[a]	4.3	0.01	0.17[b]	0.03
BAAQMD Significance Thresholds	10.0	1.0	1.0	0.30
Threshold Exceeded?	No	No	No	No

Notes:

[a] This receptor location is where the maximum health risk would occur based on modeling. No real-world sensitive receptors occur at this location.

[b] The maximally exposed individual receptor is a different location for the acute hazard index.

Biological Resources

Alternative 1 Impacts

Construction of four fish pools in the concrete flood control channel would result in temporary impacts on aquatic resources, including special-status species, during temporary dewatering. Alternative 1 construction would be conducted between June 15 and October 15, to avoid potential significant impacts on special-status fish. Alternative 1 would have no impact on special-status plants or wildlife. Alternative 1 would have no impact on riparian habitat or sensitive vegetation communities. Alternative 1 would result in a net benefit to fish passage and habitat, by creating deeper and larger fish pools adjacent to Frederick Allen Park and removing the existing fish passage barrier. Alternative 1 would not conflict with any local plans or

ordinances for protection of biological resources and would not conflict with a habitat conservation plan.

Comparison of Impacts to the Proposed Project

Alternative 1 would avoid the proposed project's temporary impacts on special-status wildlife species and temporary impacts from oak tree removal in Frederick Allen Park. Alternative 1 would achieve less benefits to special-status species, fish passage, and creek habitat, and less benefits for wildlife habitat and riparian habitat than the proposed project because Alternative 1 would not create natural creek channel and riparian habitat in Frederick Allen Park. Alternative 1 also would avoid the potential for conflicts with a local tree protection policy because it would not require tree removal in Frederick Allen Park.

Cultural Resources

Alternative 1 Impacts

Alternative 1 would not result in a substantial adverse change in the significance of a historical resource because no historical resource occurs in the vicinity of the Alternative 1 fish pools. Alternative 1 would involve excavation in the existing flood control channel. No archaeological resources or human remains are known to occur beneath the flood control channel in the excavation vicinity. Although a low risk of encountering archaeological resources would exist during Alternative 1 construction, the alternative could result in inadvertent discovery of archaeological resources. The District would implement Mitigation Measure 3.5-2, which specifies procedures to avoid impacts from inadvertent discoveries of archaeological resources. The resulting impact on archaeological resources from Alternative 1 construction would be less than significant with mitigation incorporated. Alternative 1 construction would have a less-than-significant impact from disturbance of human remains, because Alternative 1 would be implemented in compliance with Section 5097.98 of the Public Resources Code and Section 7050.5 of the Health and Safety Code, which specify procedures for handling discoveries of human remains.

Comparison of Impacts to the Proposed Project

Alternative 1 would have a slightly reduced potential to encounter archaeological resources or human remains than the proposed project, because of the reduced area of grading and ground disturbance in Frederick Allen Park. However, both the proposed project and Alternative 1 would have a low potential to encounter archaeological resources or human remains.

Energy

Alternative 1 Impacts

Alternative 1 would require use of energy resources during construction, primarily in the form of petroleum products (i.e., gasoline and diesel) used to operate construction equipment and transport materials/supplies and workers to and from the project area. Fuel use would be temporary and short-term over the approximately 2-week construction duration for the fish pools. Energy impacts from the short-term construction would be less than significant. Maintenance of Alternative 1 would require similar use of energy resources to the existing channel maintenance.

Comparison of Impacts to the Proposed Project

Compared to the proposed project, Alternative 1 would use the same types of construction equipment that require petroleum products, but construction duration and intensity would be less. Maintenance energy resources' use under Alternative 1 would be similar to that of the proposed project. Alternative 1 would have a slightly reduced impact related to energy resources compared to the proposed project because the construction duration would be shorter.

Geology and Soils

Alternative 1 Impacts

Alternative 1 would include construction of project components on similar ground and soil substrate as the proposed project. Alternative 1 would have less-than-significant impacts associated with seismicity and seismic-related events. Alternative 1 would require soil-disturbing activities, including tree and concrete removal, which would result in soil loss. Implementation of the best management practices (BMPs) described in the Stormwater Pollution Prevention Plan (SWPPP) would minimize potential impacts, and impacts related to soil loss and erosion would be less than significant. Alternative 1 would involve installation of four fish pools in upper Unit 3. Based on the initial assessment of the concrete channel downstream, enlarging the fish pools without compromising the structural integrity of the channel would be possible. Alternative 1 would not cause soils or geological conditions to become unstable, and thus the impact would be less than significant. The soil expansion potential is anticipated to be low and paleontological resources are not anticipated in sediments and rocks in the project area. Therefore, the impacts would be less than significant.

Comparison of Impacts to the Proposed Project

Alternative 1 would have similar impacts related to seismicity and seismic-related events, expansive soils, paleontological resources, and stability of geologic units as the proposed project. Alternative 1 would not involve ground-disturbing activities or tree removal in Frederick Allen Park and would avoid the potential for soil loss and erosion in Frederick Allen Park associated with the proposed project. Alternative 1 would not include removal of the concrete channel, and the existing risk related to geologic hazards from the concrete channel would remain. Alternative 1 would have a reduced impact on geology and soils when compared to the proposed project.

Greenhouse Gas Emissions

Alternative 1 Impacts

Construction of Alternative 1 would involve off-road construction equipment and vehicles that would result in construction GHG emissions that would be short-term and temporary. Operational GHG emissions would not exceed GHG significance thresholds, and impacts associated with GHG emissions would be less than significant.

Comparison of Impacts to the Proposed Project

Alternative 1 would involve the same type of equipment as that used by the proposed project, but the construction schedule would be shorter under Alternative 1 because no construction

would occur in Frederick Allen Park. The number of construction truck trips under this alternative also would be slightly lower than the proposed project because of avoidance of Frederick Allen Park, which would reduce the construction GHG emissions. Operational GHG emissions under Alternative 1 would be the same as the proposed project. GHG emission impacts associated with implementation of Alternative 1 would be less than that of the proposed project.

Hazards and Hazardous Materials

Alternative 1 Impacts

Alternative 1 would require use of hazardous materials to operate equipment in construction of the fish pools. Hazardous emissions from Alternative 1 in combination with the remaining project elements are discussed previously under Air Quality. This construction would be more than 0.25 mile from a school. The new fish pools would be within the existing concrete channel and would not interfere with implementation of an emergency response plan. Maintenance of the existing flood control channel and fish pools under Alternative 1 would involve limited quantities of hazardous materials.

Comparison of Impacts to the Proposed Project

Construction of Alternative 1 would have slightly less impact than the proposed project in use of hazardous materials and hazardous emissions, because the alternative would require less construction equipment and would have a shorter construction duration in avoidance of construction in Frederick Allen Park.

Hydrology and Water Quality

Alternative 1 Impacts

Water Quality

Alternative 1 would require excavation of soils within the concrete channel to create large fish pools. The excavation area would be limited, and construction of the large fish pools would not violate any water quality standards. Alternative 1, in combination with the remaining project elements in Unit 4, lower Unit 3, and Unit 2, would result in a slight increase in velocity of approximately 0.4 to 2 feet/secondin areas of the concrete channel in Units 2 and 3, and an increase in velocity greater than 2 feet/second in Unit 4 under the 10-year and 25-year flood events, as shown in Figure 5.3-2 through Figure 5.3-4. The increase in velocity relative to baseline conditions would be less under the 100-year event than under the 10-year and 25-year events. The increase in velocity would be caused by removal of the Denil fish ladder, which would remove a constriction and thereby increase the flow capacity of the channel at the fish ladder location. The increase in velocity of approximately 2 feet/second would not cause a significant increase in erosion because the velocity increase would be minimal and would be concentrated in Unit 4, where the proposed project would incorporate streambank stabilization measures to protect the creek bank from erosion. The impact on erosion would be less than significant.

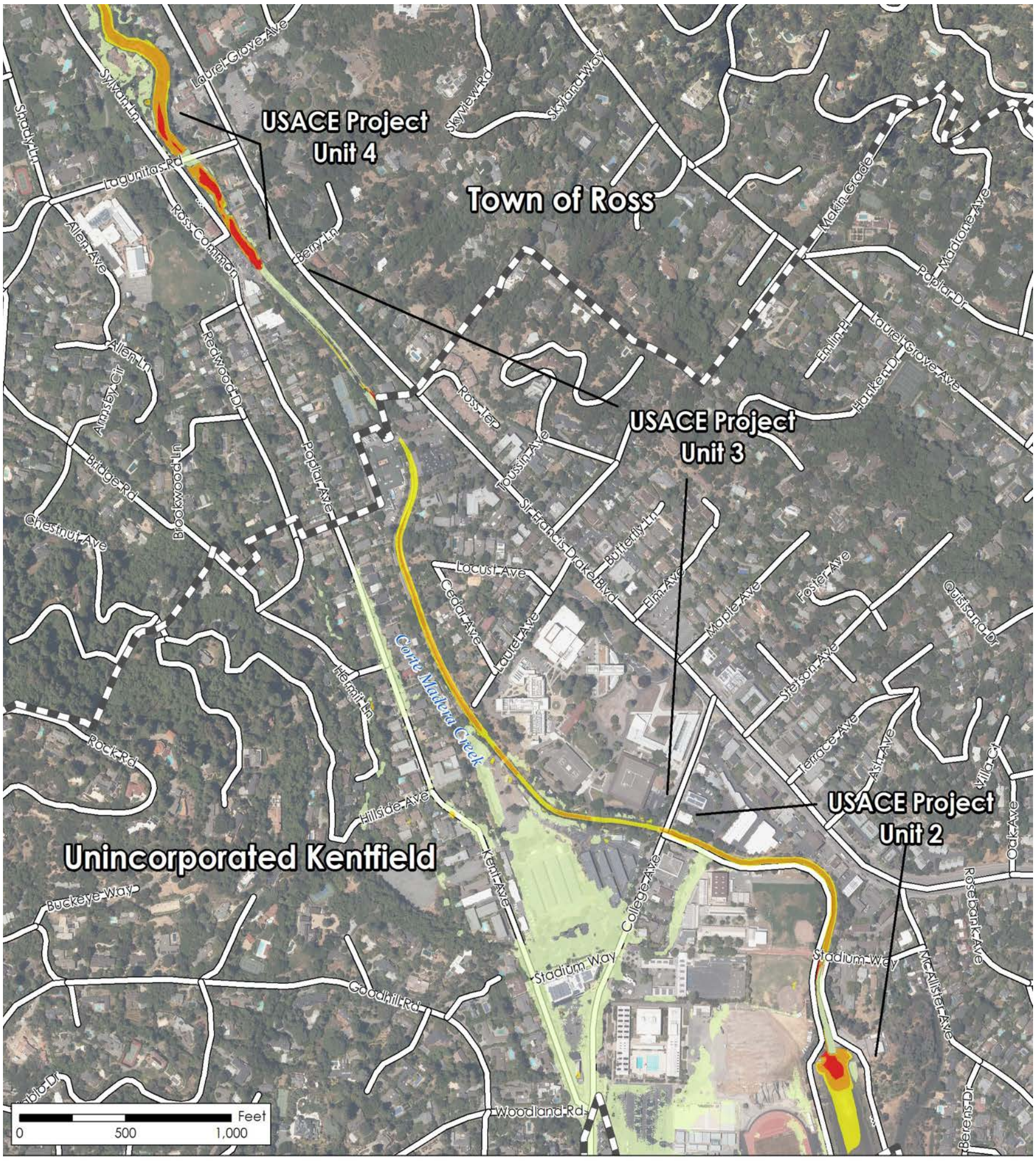
Flooding

Alternative 1 would result in reduced flood hazards in the town of Ross and Kentfield, as shown in Figure 5.3-5 through Figure 5.3-7. Figure 5.3-5 through 5.3-7 represent Alternative 1 impacts on the future condition baseline, including sea level rise projections included in the future condition baseline as discussed in Section 3.9 Hydrology. Alternative 1 would result in increased water surface elevations in the concrete channel where the new fish pools would be installed and flooding also would increase approximately 0.5 to 1 foot in the concrete channel below College Avenue during the 10-year, 25-year, and 100-year flood event. Small areas directly adjacent to the concrete channel in the parking area at the College of Marin west of College Avenue and a parking area east of College Avenue also would be subject to increase in water surface elevation of 0.2 to 1 foot during the 10-year, 25-year, and 100-year flood events. A small area adjacent to the concrete channel within Frederick Allen Park and within residential areas on the left bank of Corte Madera Creek would be subject to increased water surface elevation of 0.2 to 0.5 foot during the 100-year flood event as shown on Figure 5.3-7. Substantial reduction in water surface elevation, including model-predicted removal of flooding, would occur during the 10-year, 25-year, and 100-year flood events in the Town of Ross along Sylvan Lane, Sir Francis Drake Boulevard, Lagunitas Road, Ross Common, Poplar Avenue, and Redwood Road. Flooding also would be reduced along Kent Avenue and in the Granton Park neighborhood and the residential area north of Corte Madera Creek and east of College Avenue in the Kentfield area.

Comparison of Impacts to the Proposed Project

Alternative 1 would have a slightly less construction impact on water quality than the proposed project, because Alternative 1 would avoid construction disturbance of soils in Frederick Allen Park. Alternative 1 would not create increased riparian and natural stream channel functions in Frederick Allen Park and would not have the same long-term water quality benefits as the proposed project. Alternative 1 would have similar impacts and benefits to flooding as the proposed project, as shown in the flood reduction figures; however, in a 100-year storm event, Alternative 1 would have less flood reduction benefit and would result in increased water surface elevation compared to the proposed project, particularly along Poplar Avenue. Figure 5.3-8 shows the difference in model-predicted water surface elevations between Alternative 1 and the proposed project, under a 100-year storm event. Alternative 1 would result in lower water surface elevation in the creek channel and in the Frederick Allen Park floodplain because the floodplain area would not be constructed. However, residential and commercial areas around Frederick Allen Park would experience reduced flood reduction benefits under Alternative 1 than would be experienced with the proposed project.

Figure 5.3-2 Alternative 1 Changes in Velocity from Future Conditions - 10-Year Flood Event



Legend

Scale = 1:9,000

Town/County Boundary

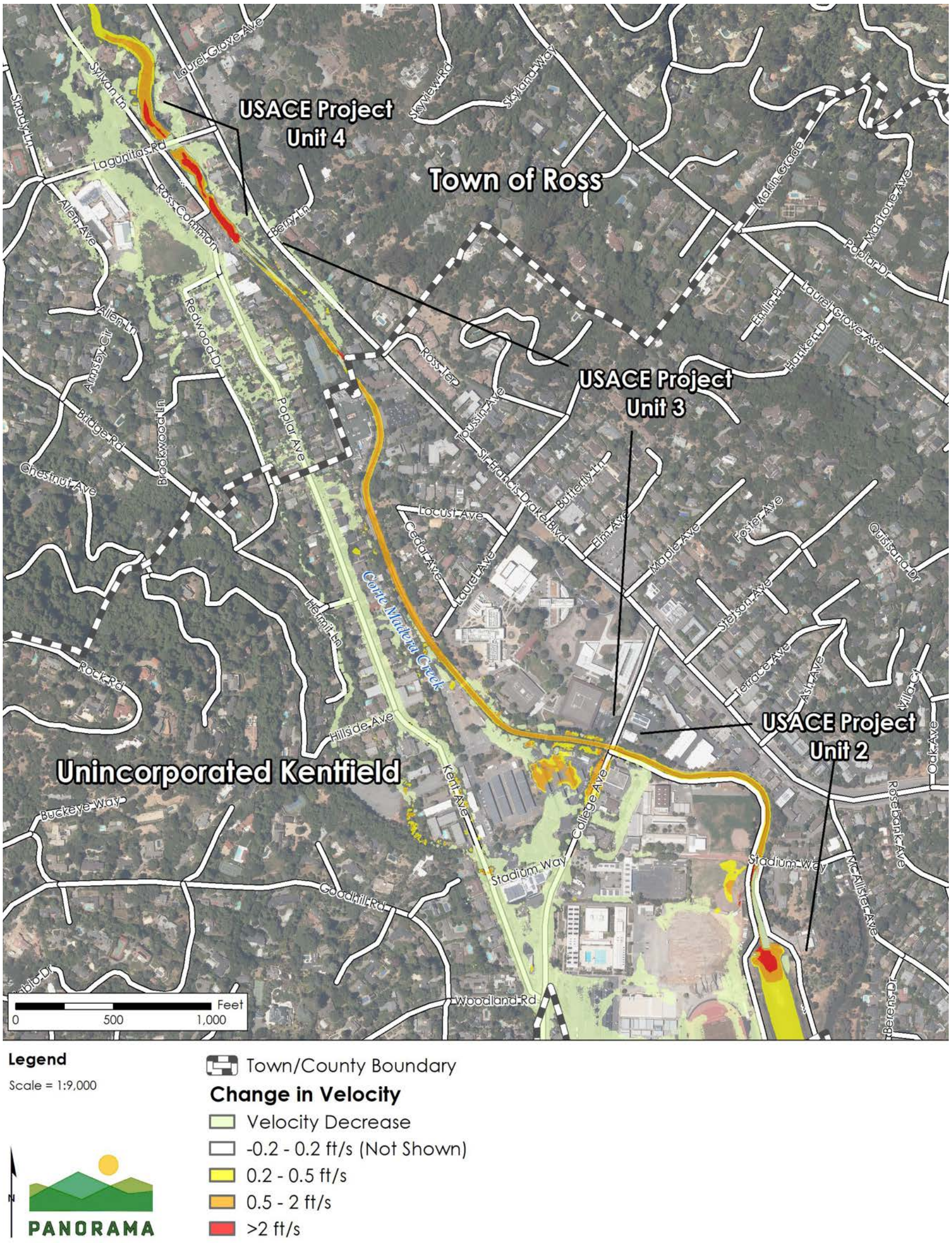
Change in Velocity

- Velocity Decrease
- -0.2 - 0.2 ft/s (Not Shown)
- 0.2 - 0.5 ft/s
- 0.5 - 2 ft/s
- >2 ft/s

PANORAMA

Source: (GHD, 2020)

Figure 5.3-3 Alternative 1 Changes in Velocity from Future Conditions - 25-Year Flood Event



Legend

Scale = 1:9,000

Town/County Boundary

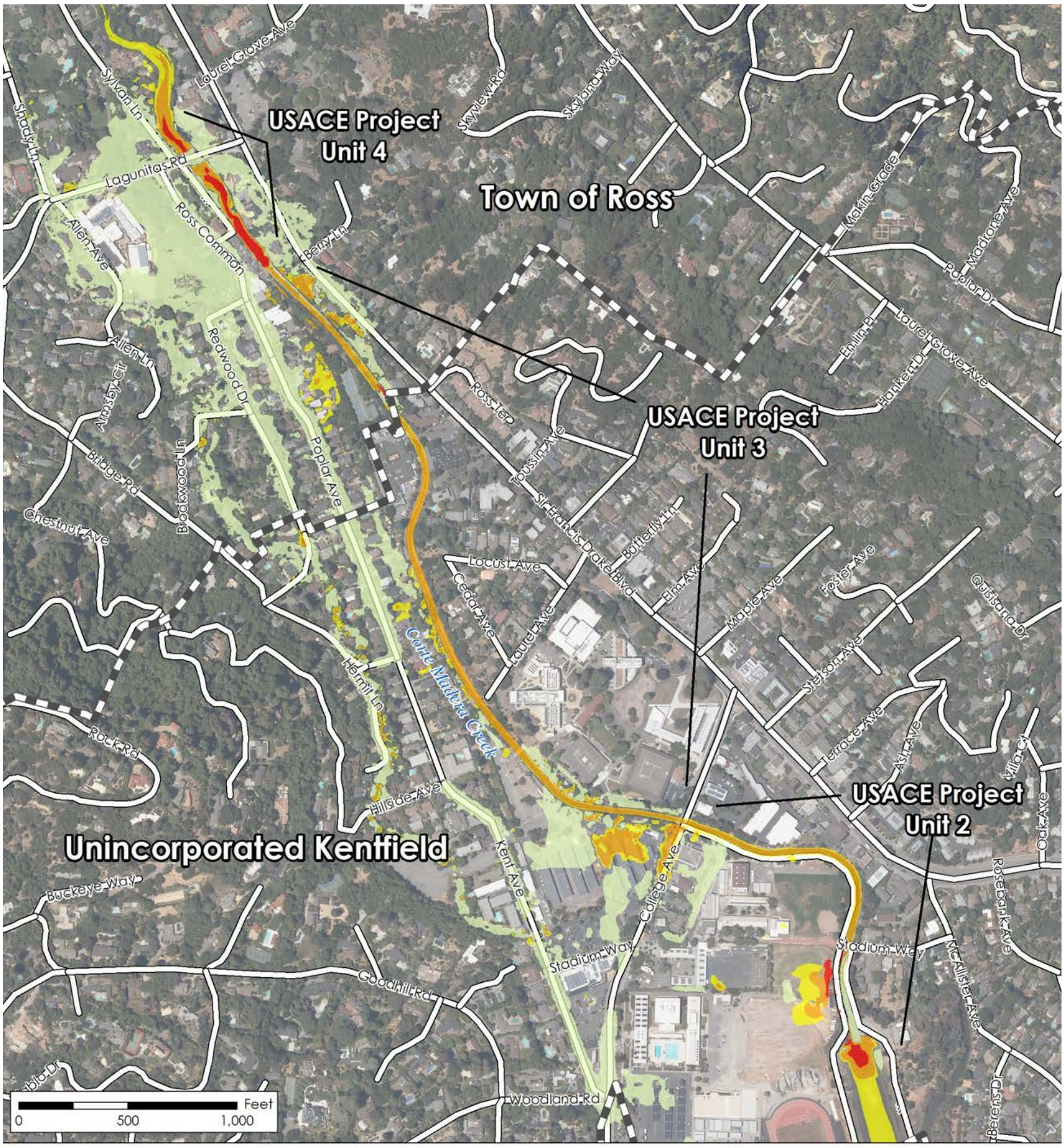
Change in Velocity

- Velocity Decrease
- -0.2 - 0.2 ft/s (Not Shown)
- 0.2 - 0.5 ft/s
- 0.5 - 2 ft/s
- >2 ft/s

PANORAMA

Source: (GHD, 2020)

Figure 5.3-4 Alternative 1 Changes in Velocity from Future Conditions - 100-Year Flood Event



Legend

Scale = 1:9,000

Town/County Boundary

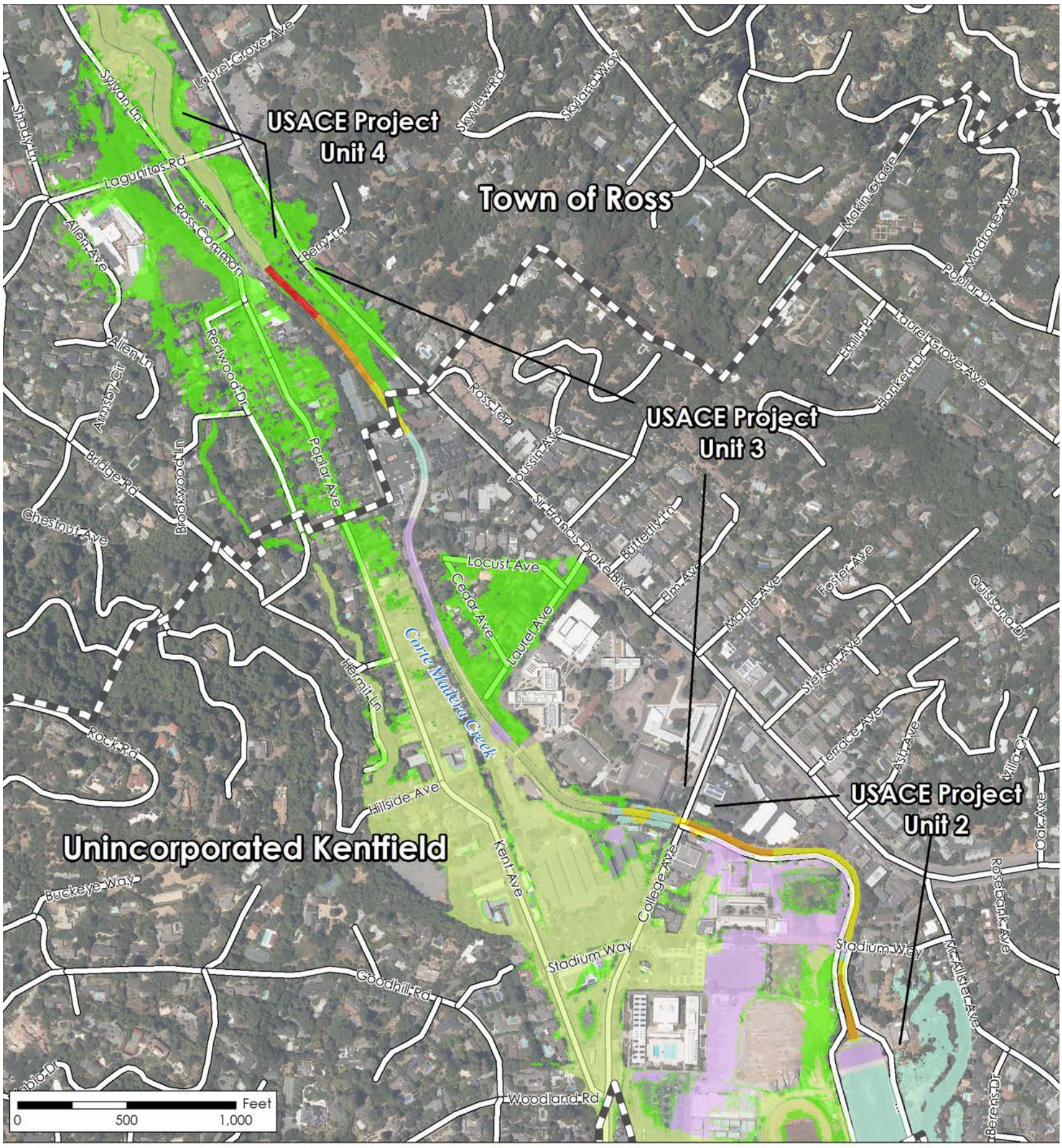
Change in Velocity

- Velocity Decrease
- -0.2 - 0.2 ft/s (Not Shown)
- 0.2 - 0.5 ft/s
- 0.5 - 2 ft/s
- >2 ft/s

PANORAMA

Source: (GHD, 2020)

Figure 5.3-5 Alternative 1 Changes in Water Surface Elevation, Future Conditions, 10-Year Flood Event



Legend

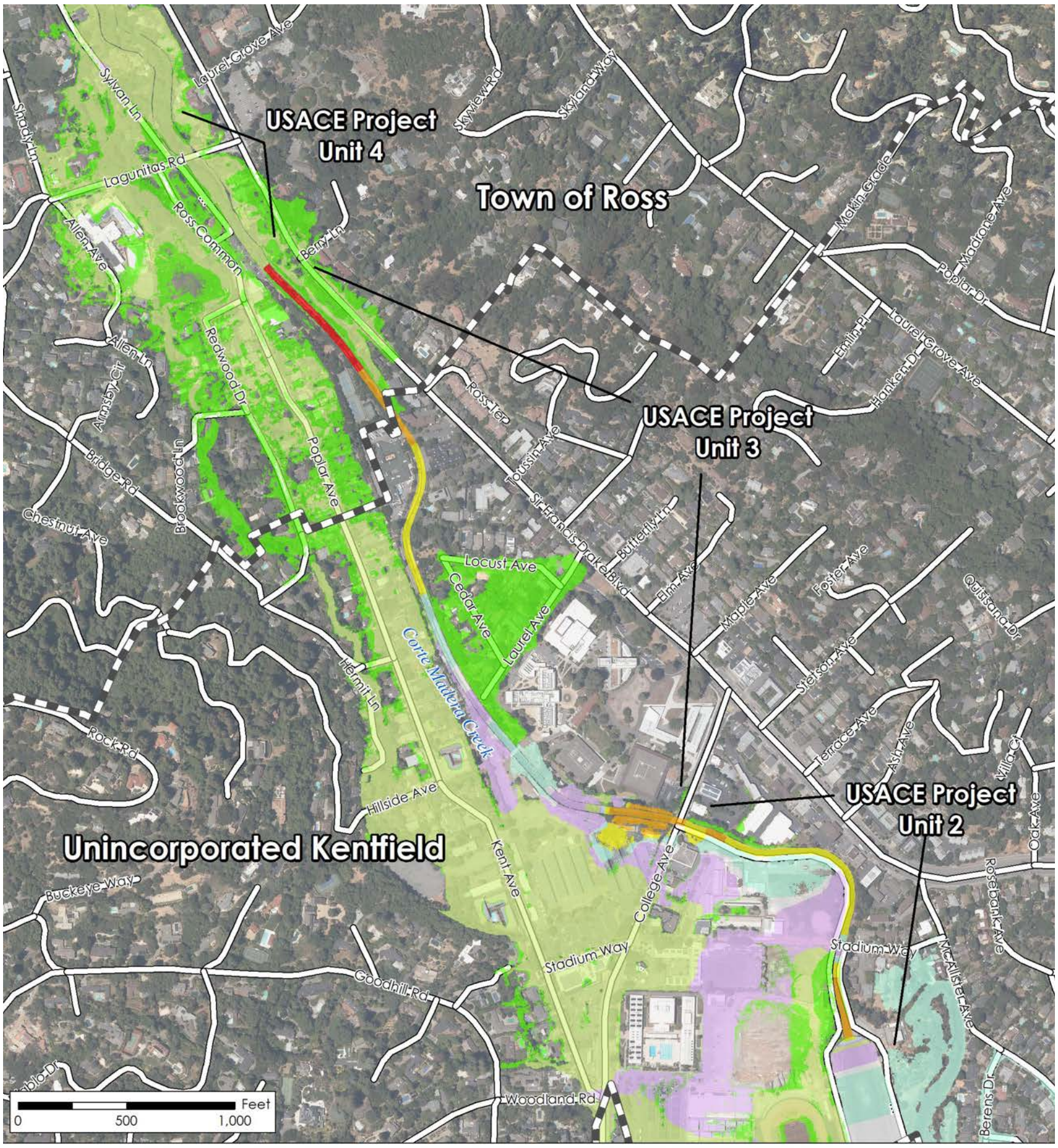
Scale = 1:9,000

- Town/County Boundary
- Flows Confined to Channel
- Flooding Reduced
- -0.2' - -0.02'
- -0.02' - 0.02'
- 0.02' - 0.2'
- 0.2' - 0.5'
- 0.5' - 1'
- >1'

PANORAMA

Source: (GHD, 2020)

Figure 5.3-6 Alternative 1 Changes in Water Surface Elevation, Future Conditions, 25-Year Flood Event



Legend

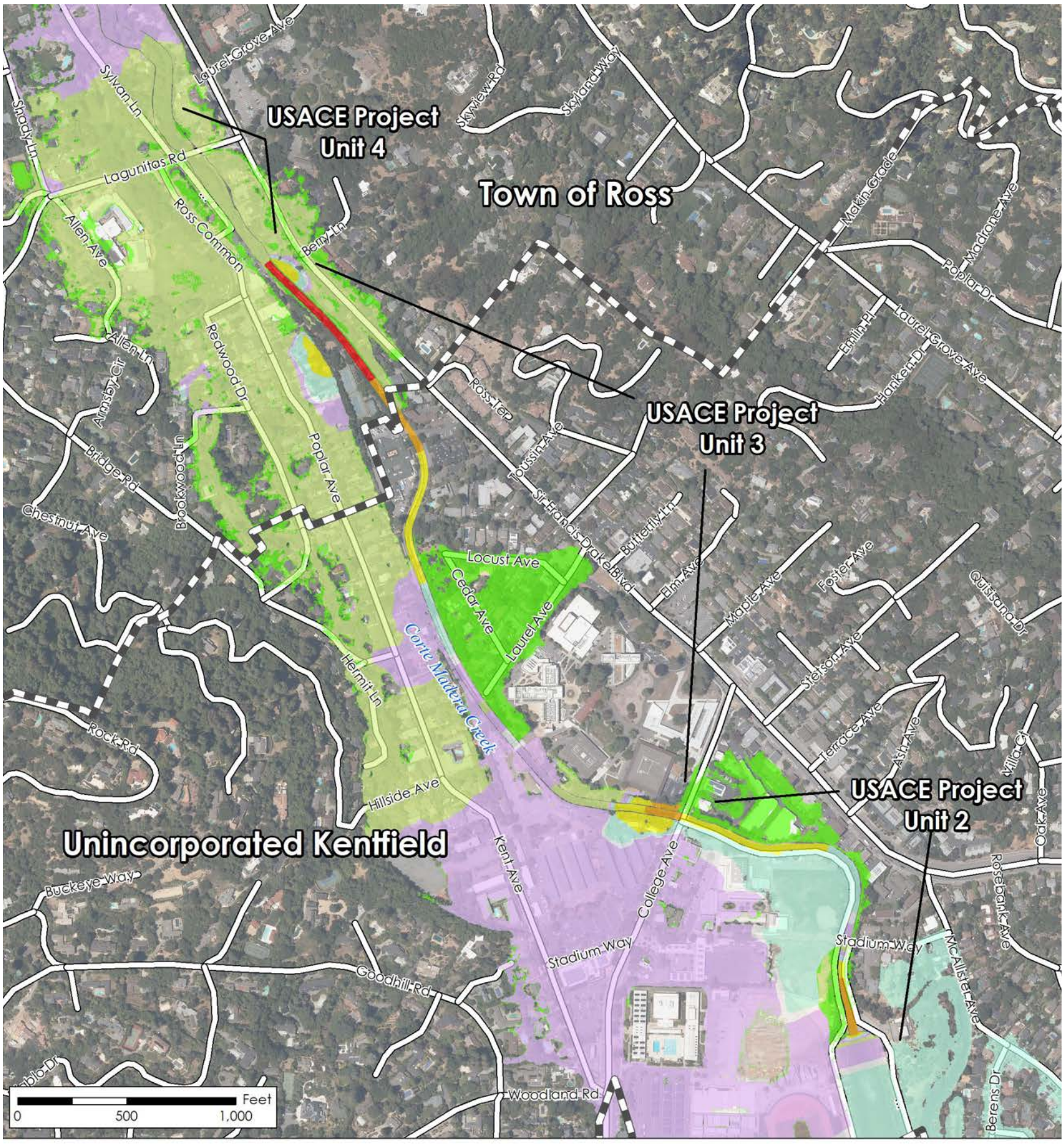
Scale = 1:9,000

- Town/County Boundary
- Flows Confined to Channel
- Flooding Reduced
- -0.2' - -0.02'
- -0.02' - 0.02'
- 0.02' - 0.2'
- 0.2' - 0.5'
- 0.5' - 1'
- >1'

PANORAMA

Source: (GHD, 2020)

Figure 5.3-7 Alternative 1 Changes in Water Surface Elevation, Future Conditions, 100-Year Flood Event



Legend

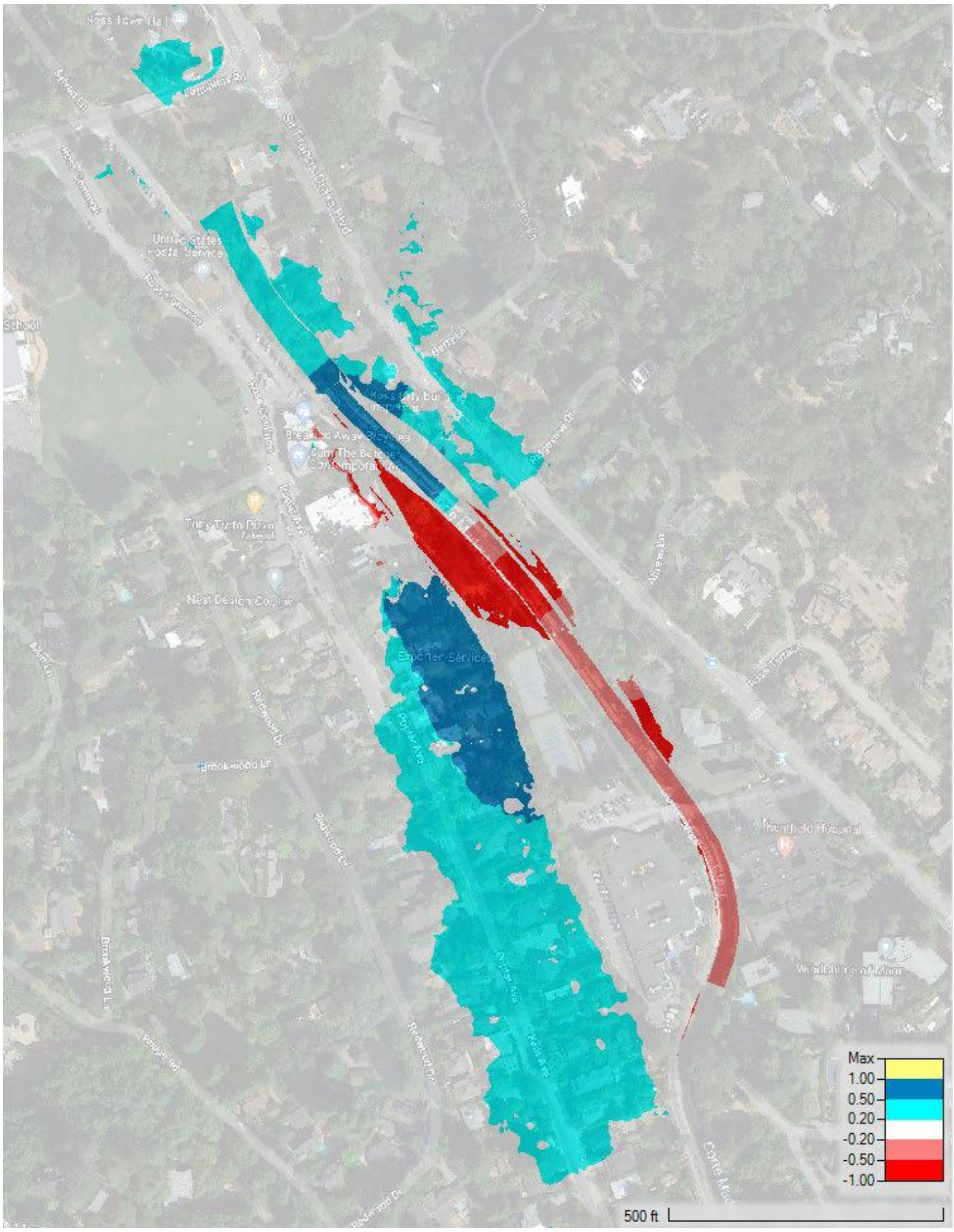
- Town/County Boundary
- Flows Confined to Channel
- Flooding Reduced
- -0.2' - -0.02'
- -0.02' - 0.02'
- 0.02' - 0.2'
- 0.2' - 0.5'
- 0.5' - 1'
- >1'

Scale = 1:9,000

PANORAMA

Source: (GHD, 2020)

Figure 5.3-8 Difference in Future Water Surface Elevation Between Alternative 1 and Proposed Project – 100-Year Flood Event



Source: (GHD, 2020)

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Noise

Alternative 1 Impacts

Alternative 1 would generate noise and vibration during the two weeks of construction of the fish pools. This noise would be partially attenuated by the existing concrete walls, and the noise and vibration impact would be less than significant. Alternative 1 would not occur in an airport land use plan area. The noise from maintenance of Alternative 1 would be similar to noise generated during maintenance of the existing concrete channel and fish pools and the Alternative 1 maintenance impact would be less than significant.

Comparison of Impacts to the Proposed Project

Alternative 1 would avoid the potentially significant construction noise impacts of the proposed project. Alternative 1 would generate less short-term noise impacts than the proposed project and similar long-term maintenance noise as the proposed project.

Public Services

Alternative 1 Impacts

Alternative 1 would not cause a need for new or altered government facilities related to fire protection, police protection, schools, and parks. The fish pools to be constructed in the concrete channel adjacent to Frederick Allen Park would not increase the need for fire or police services, and the alternative would not induce population growth or increase the need for new schools. Alternative 1 would require maintenance of the concrete flood control channel similar to existing conditions.

Comparison of Impacts to the Proposed Project

Alternative 1 would have the same less-than-significant impact on public services as the proposed project.

Recreation

Alternative 1 Impacts

Alternative 1 would not impact Frederick Allen Park. The additional fish pools would have no impact on recreation.

Comparison of Impacts to the Proposed Project

Construction of Alternative 1 would not involve closures of Fredrick Allen Park and Bike Route 20 through Frederick Allen Park because the alternative would not include modifications to Frederick Allen Park. Alternative 1 would not increase the use of existing parks, include new recreational facilities, or affect existing recreational opportunities. Alternative 1 would avoid the proposed project impacts from increased flooding of the multi-use pathway in Frederick Allen Park and temporary loss of shade. Alternative 1 also would avoid the less-than-significant impacts from the new public access to the creek. Alternative 1 would not have the beneficial impact on the recreational experience in Fredrick Allen Park, resulting from opportunities afforded through increased creek and habitat viewing.

Transportation and Circulation

Alternative 1 Impacts

Alternative 1 would require access of the concrete channel off area roads and would not conflict with any transportation management plan or policy. The alternative would not require closure of any bike route.

Comparison of Impacts to the Proposed Project

Alternative 1 would involve minimal vehicle miles traveled from maintenance of the existing flood control channel, similar to the proposed project. Alternative 1 would avoid the proposed project's potentially significant, construction-related impacts on transportation and traffic resulting from temporary closure of Bike Route 20 in Frederick Allen Park. Alternative 1 would have a less-than-significant impact on transportation and circulation from vehicle miles traveled to maintain the flood control channel.

Tribal Cultural Resources

Alternative 1 Impacts

Alternative 1 would involve minimal ground-disturbing activities where the fish pools would be excavated in the concrete channel. The potential impact on tribal cultural resources would be less than significant.

Comparison of Impacts to the Proposed Project

Alternative 1 would have a slightly reduced potential to encounter tribal cultural resources during earthwork than the proposed project because Alternative 1 would not involve grading and excavation in Frederick Allen Park. However, both the proposed project and alternative would have a low potential to affect tribal cultural resources.

Utilities and Service Systems

Alternative 1 Impacts

Alternative 1 would not require or result in relocation or construction of new water conveyance, wastewater treatment, or stormwater drainage, or the addition of electric power, natural gas, or telecommunications facilities. Alternative 1 would not require water supplies because the fish pools would be constructed within the channel. The fish pool construction would generate a very minimal volume of solid waste from the area of fish pool excavation. The impact would be less than significant.

Comparison of Impacts to the Proposed Project

Alternative 1 would have a reduced impact on utilities and service systems, compared to construction of the proposed project in Frederick Allen Park. Alternative 1 would require less water because water to stabilize the soil in Frederick Allen Park would not be required. Alternative 1 also would generate less waste because excavation at Frederick Allen Park would not occur. Alternative 1 and the proposed project would have a similar, less-than-significant impact on utilities during operation and maintenance.

Agriculture and Forestry, Land Use and Planning, Mineral Resources, Population and Housing, Socioeconomics, and Wildfire

Alternative 1 Impacts

Alternative 1 would not involve impacts on lands containing agricultural or forestry resources or mineral resources. Alternative 1 would not involve changes in land use or character of the community and would not conflict with the Town of Ross General Plan, Kentfield General Plan, or Marin Countywide Plan. Alternative 1 would not induce unplanned population growth, and planned growth would continue as under existing conditions. Alternative 1 would not involve any activities in a very high fire hazard area.

Comparison of Impacts to the Proposed Project

Alternative 1 would avoid the proposed project's less-than-significant impacts related to dividing an established community. Alternative 1 would have slightly less impact on land use compared to the proposed project.

Alternative 1 Summary, Feasibility, and Objectives

Alternative 1 would have less severe less than significant construction impacts on aesthetics, air quality, biological resources, geology and soils, GHG emissions, hazardous materials, hydrology and water quality, noise, recreation, transportation and circulation, and utilities than the proposed project (all of which would be less than significant with mitigation under the proposed project). Alternative 1 would avoid significant and unavoidable impacts on visual quality during the vegetation establishment period (approximately 10 years). The Alternative 1 impacts would have the same less than significant impacts to the proposed project impacts on cultural resources, tribal cultural resources, public services, agriculture and forestry resources, minerals, land use and planning, population and housing, and wildfire.

Alternative 1 would have less long-term benefits to aesthetics, biological resources, geology and soils, hydrology and water quality, and recreation than the proposed project because Alternative 1 would not include creation of a natural creek channel, floodplain, and riparian habitat in Frederick Allen Park. The fish pools in the concrete channel would result in limited benefits to habitat for fish and would not benefit terrestrial species or habitat over the long-term.

As described in Table 5.2-1, Alternative 1 is expected meet all feasibility criteria and would meet most project objectives.

5.3.3 Alternative 2: Boardwalk in Frederick Allen Park

Description

Alternative 2 would maintain the existing elevation for Bike Route 20 in Frederick Allen Park. The elevation of Bike Route 20 would be maintained at the current bike path elevation by constructing the multi-use path as a boardwalk, slightly elevated above the Frederick Allen Park floodplain area. The multi-use path would be along the western perimeter of the park and adjacent to the new, approximately 2-foot-tall floodwall. The boardwalk then would meander

back to join the existing pathway, as shown in Figure 5.3-8. The use of a boardwalk would allow the pathway to maintain its current elevation without causing loss of floodplain storage and would allow planting vegetation beneath the boardwalk. Alternative 2 also would differ from the proposed project because it would not include new public access to the creek. New access would be created for creek and flood control maintenance only. Alternative 2 would not modify any proposed project elements outside Frederick Allen Park. Alternative 2 would differ from the proposed project only in the elevation, alignment, and material used to construct the realigned Bike Route 20 in Frederick Allen Park, the location of the maintenance access path, and the removed proposed public access to Corte Madera Creek.

Environmental Impacts

Alternative 2 would involve construction of all the same elements as the proposed project, except that construction of the realigned multi-use path through the newly-created floodplain under the proposed project would be replaced with constructing a new boardwalk and restricting public use of the new creek access in Frederick Allen Park. The following resource impact discussions focus on the impacts from these two elements that differ from the proposed project. All other environmental impacts from Alternative 2 would be the same as the proposed project, which are discussed in Chapter 3.

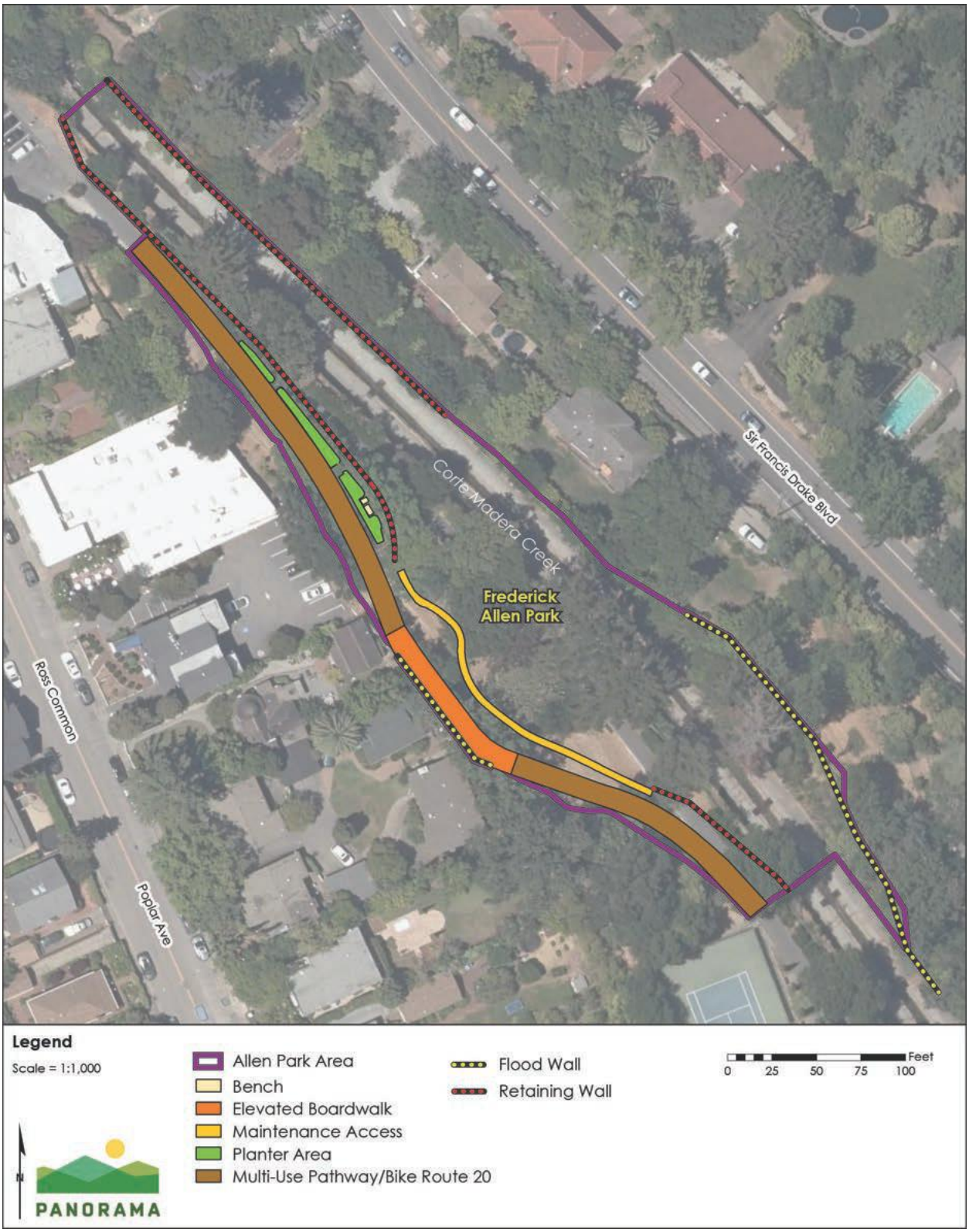
Aesthetics and Visual Resources

Alternative 2 Impacts

The Alternative 2 area is not visible from a state scenic highway and would not affect scenic resources along a state scenic highway. Alternative 2 would not conflict with applicable zoning and other regulations governing scenic quality. Alternative 2 would not create a new source of substantial light or glare that would affect day or nighttime views. The alternative pathway design through use of a boardwalk would not conflict with applicable zoning or other regulations governing scenic quality. The Alternative 2 boardwalk would be an area of Frederick Allen Park that contains 13 trees. Trees along the Alternative 2 boardwalk would be removed as part of the proposed floodplain construction and grading in Frederick Allen Park, which are discussed in Chapter 3. Construction of the Alternative 2 boardwalk and maintenance path would not require removal of any additional trees beyond those that would be removed for the proposed project. Alternative 2 would allow additional vegetation planting in Frederick Allen Park because the boardwalk would allow light to penetrate beneath the pathway, and ferns or other small vegetation could be planted in the floodplain beneath the elevated, multi-use boardwalk. The maintenance access path would be 4 feet wide and would parallel the creek. Trees, shrubs, and riparian vegetation would be planted on either side of the narrow maintenance path. The maintenance path would be unpaved to create a natural appearance in the creek corridor. Stairs would be constructed from the retaining wall at the north end of the park to the maintenance path, to provide through access. An artistic rendering of Alternative 2 is shown in Figure 5.3-9.

The impact on visual quality of just the Alternative 2 boardwalk and maintenance pathway would be less than significant. However, implementation of Alternative 2 would require construction of the floodplain in Frederick Allen Park, which would require removal of up to

Figure 5.3-9 Alternative 2 Layout



Source: (GHD, 2020)

Figure 5.3-10 Alternative 2 Visual Representation Looking North from the Tennis Courts at Frederick Allen Park



145 trees for floodplain grading. Alternative 2 would include planting a similar number of trees and similar species to those of the proposed project, as shown in the landscape plan provided in Appendix B. Additional trees could be planted because Alternative 2 would be adjacent to the 2-foot-tall floodwall, and the boardwalk would occupy the majority of the 15-foot setback from the floodwall. Therefore, the remaining area in Frederick Allen Park would not be subject to vegetation setbacks. Locating the boardwalk along the edge of the park also would create a visually uniform view across the floodplain and park, for viewers looking from the boardwalk toward the replanted areas.

Alternative 2 still would result in a significant and unavoidable impact immediately following construction and up to 10 years after construction, because of the loss of dense vegetation and tree canopy while the newly planted trees develop and establish in the area. The reduction in tree canopy would result in reduced intactness and unity in the landscape because the new concrete retaining walls and homes opposite the park would become more visible. After 10 years of vegetation establishment, the tree canopy and vegetation would visually screen the concrete retaining wall and residential areas and would create a uniform and intact landscape, as shown in Figure 5.3-9. The landscape vividness, intactness, and unity would increase relative to existing conditions because the natural creek channel and riparian vegetation would allow for views of a stream corridor with understory and canopy vegetation that appear consistent with the stream/riparian context, and the impact would be a net benefit to visual quality after 10 years of vegetation growth.

Comparison of Impacts to the Proposed Project

Alternative 2 would have comparable short-term impacts on visual quality to the proposed project because Alternative 2 would require removal of trees from the same area in Frederick Allen Park. The visual impact of Alternative 2 would be equivalent to the project.

Air Quality and Greenhouse Gas Emission

Alternative 2 Impacts

Alternative 2 would require use of construction equipment to construct the boardwalk and maintenance access path. Implementation of Alternative 2 in combination with the proposed project elements in other areas would result in generation of air quality and GHG emissions equivalent to the proposed project, including emissions of toxic air contaminants because the boardwalk and maintenance path would be constructed in lieu of the paved pathway and unpaved access to the creek. Implementation of Mitigation Measures 3.3-2 and Mitigation Measure 3.3-3, which would require implementation of dust control measures and use of USEPA or CARB Tier 3 or higher rated equipment would reduce the impact of Alternative 2 in combination with the proposed project in other areas to a less-than-significant level, similar to the project impact described in detail in Chapter 3. Alternative 2 would require removal of the same number of trees as the proposed project. Alternative 2 would allow increased planting relative to the proposed project because light and water could penetrate the boardwalk, which would allow planting underneath it.

Comparison of Impacts to the Proposed Project

The Alternative 2 air quality and GHG emission impacts would be equivalent to the proposed project. Compared to the proposed project, Alternative 2 would result in a minor long-term net benefit on GHG emissions because of increased carbon sequestration from planting below the boardwalk.

Biological Resources

Alternative 2 Impacts

The Alternative 2 boardwalk and maintenance pathway would be in the same area of proposed project grading and vegetation removal. The impacts from construction of the Alternative 2 boardwalk and maintenance path would be equivalent to the direct and indirect impacts otherwise described for construction of the proposed project in Frederick Allen Park. Alternative 2 would not result in any new or increased impacts on biological resources. Alternative 2 would not create public access to Corte Madera Creek and would avoid the proposed project's less-than-significant impact from new access to the creek. Alternative 2 would allow vegetation planting beneath the boardwalk and would create more riparian areas than the proposed project.

Comparison of Impacts to the Proposed Project

Alternative 2 direct and indirect construction impacts on biological resources would be equivalent to the proposed project. Alternative 2 would result in less operational impacts on biological resources than the proposed project because Alternative 2 would not create public access to the creek. Alternative 2 also would increase more areas of riparian planting than the proposed project, resulting in additional benefits from increased riparian areas.

Cultural Resources

The Alternative 2 boardwalk and maintenance path construction would be in areas of proposed project grading. Alternative 2 would result in equivalent impacts on cultural resources to the proposed project because Alternative 2 would require grading and construction in the same areas as the proposed project and would have the same potential to disturb significant cultural resources. The impact would be less than significant with mitigation incorporated, as described in Chapter 3.

Energy

The intensity of construction of the boardwalk would be roughly equivalent to the intensity of construction of the proposed project paved multi-use pathway and unpaved creek access in Frederick Allen Park. The Alternative 2 boardwalk and maintenance path construction would require energy (fuel) use equivalent to the proposed project. The impact on energy use during construction would be less than significant. The Alternative 2 boardwalk and maintenance pathway would require similar maintenance to the proposed project paved multi-use pathway. Furthermore, the impact on energy use during Alternative 2 maintenance would be less than significant. Therefore, the impact of Alternative 2 would be equivalent to the proposed project.

Geology and Soils

Alternative 2 Impacts

Alternative 2 would be on the same geologic and soil units as the proposed project in Frederick Allen Park. The raised boardwalk structure potentially could result in geologic hazards from seismic activity unstable soil conditions, if a geotechnical investigation is not performed or geotechnical recommendations for the boardwalk are not implemented. The District would implement Mitigation Measures 3.6-1, which would require completion of a geotechnical survey and implementation of all geotechnical recommendations in the final design. The impact from implementation of Alternative 2 would be less than significant with mitigation incorporated.

Comparison of Impacts to the Proposed Project

Alternative 2 would have a slightly increased potential for geologic hazards because of the raised structure; however, the impact of Alternative 2 would be equivalent to the proposed project, with implementation of the geotechnical recommendations.

Hazards and Hazardous Materials

Alternative 2 would require use of the same volume, type, and quantity of hazardous materials as the proposed project in Frederick Allen Park, and the impact from hazardous materials would be less than significant. Alternative 2 would slightly reduce the less-than-significant flood hazard impact, because of relocating the multi-use pathway to an elevated boardwalk above the floodplain. The potential for flooding of the boardwalk would be less than that of the proposed project's multi-use pathway, and thus the potential hazard would be slightly less than the proposed project. The Alternative 2 impact on hazards and hazardous materials would be slightly less than the proposed project impact because of the elevation of the boardwalk above the floodplain.

Hydrology and Water Quality

Alternative 2 Impacts

Alternative 2 construction would require grading and excavation in the same areas as the proposed project and would have the same low potential to encounter contaminated sediments that contain water quality pollutants, similar to the proposed project. Implementation of Mitigation Measure 3.10-1 would require testing of excavated sediment to evaluate the risk of contamination. Through proper handling and treatment of any potentially contaminated soils, the water quality impact would be less than significant. The Alternative 2 boardwalk would reduce the amount of impervious surface used in pathway construction and would allow slightly increased groundwater infiltration and reduced runoff. The Alternative 2 boardwalk would be above the floodplain in Frederick Allen Park, and the boardwalk would not see increased flooding over existing conditions.

Comparison of Impacts to the Proposed Project

Alternative 2, in combination with the project elements in other areas, would result in the same water surface elevation increase as the proposed project and would achieve the same flood reduction benefits as the proposed project. Alternative 2 impacts on hydrology and water

quality would be slightly less than the proposed project impacts because the boardwalk would allow increased infiltration and would be elevated above the floodplain.

Noise

Alternative 2 Impacts

Construction of the Alternative 2 boardwalk would result in noise and vibration during installation of the footings and creation of the boardwalk pathway. The boardwalk would be adjacent to commercial buildings and would not result in increased noise to adjacent sensitive receptors. Alternative 2 would not reduce the potentially significant noise impact of the proposed project in other areas. The boardwalk would be installed adjacent to structures on Poplar Avenue and the vibration impact would be potentially significant, similar to the proposed project. Implementation of Mitigation Measure 3.11-2 would require monitoring the vibration and taking measures to reduce the vibration if it approaches criteria thresholds near buildings. Because the District would implement Mitigation Measure 3.11-2, the resulting Alternative 2 vibration impact would be less than significant with mitigation incorporated.

Comparison of Impacts to the Proposed Project

The Alternative 2 boardwalk would require similar intensity of maintenance to the proposed project paved path, or maintenance of the existing pathway. The Alternative 2 noise and vibration impacts would be less than significant with mitigation incorporated and equivalent to the proposed project noise and vibration impacts.

Public Services

Alternative 2 Impacts

Alternative 2 would not generate a need for new or altered government facilities, related to fire protection, police protection, schools, and parks. The boardwalk in Frederick Allen Park would not increase the need for fire department or police services, would not induce population growth, and would not increase the need for new schools. Alternative 2 would require maintenance of the boardwalk's pathway, similar to existing conditions.

Comparison of Impacts to the Proposed Project

Alternative 2 would have the same less-than-significant impact on public services as the proposed project. Alternative 2 impacts on public services would be equivalent to the proposed project.

Recreation

Alternative 2 Impacts

Alternative 2 would not involve closures of Fredrick Allen Park and Bike Route 20 through Frederick Allen Park during construction of the boardwalk. Alternative 2 would not include new public access to the creek. Alternative 2 would locate the Bike Route 20 on a boardwalk above the floodplain, where the pathway would not be subject to increased flooding. Alternative 2 would require removal of trees to construct the elevated pathway, maintenance access, and habitat.

Comparison of Impacts to the Proposed Project

Alternative 2 would involve landscaping with new riparian trees and vegetation and the temporary loss of shade would result in impacts on the recreation experience, similar to the proposed project as described in Chapter 3. Alternative 2 would avoid the proposed project impacts from increased flooding of the multi-use pathway in Frederick Allen Park. Alternative 2 also would avoid the proposed project's less-than-significant impacts from the new access to the creek. Alternative 2 would equivalent beneficial impact on the recreational experience in Fredrick Allen Park to the proposed project, by providing increased creek and habitat viewing and educational opportunities.

Transportation and Circulation

Alternative 2 Impacts

Alternative 2 would require temporary closure of Bike Route 20 during construction of the boardwalk and related landscaping in Frederick Allen Park. The impact from this temporary closure would be potentially significant. Implementation of Mitigation Measure 3.14-1 would require detours for bicyclists and pedestrians during construction, to maintain bicycle and pedestrian access. The impact from Alternative 2 construction would be less than significant with mitigation incorporated, because of the use of safe detours. Alternative 2 would require similar maintenance as the proposed project pathway and existing pathway in Frederick Allen Park. The operation and maintenance impact would be less than significant.

Comparison of Impacts to the Proposed Project

Alternative 2 would require an equivalent construction duration to that of the proposed project and would result in equivalent, temporary impacts on traffic and transportation. The Alternative 2 boardwalk would be elevated above the floodplain and would not be subject to increased flooding, resulting in less long-term impacts on bicycle and pedestrian transportation than the proposed project.

Tribal Cultural Resources

Alternative 2 would involve construction of the boardwalk and maintenance pathway in the same location as proposed project grading and construction. Alternative 2 would have an equivalent potential to encounter and disturb tribal cultural resources as the proposed project. The impact on tribal cultural resources would be less than significant with mitigation incorporated, as described in Chapter 3.

Utilities and Service Systems

Alternative 2 Impacts

Construction of the boardwalk pathway and maintenance path would have no impact on utilities. The boardwalk and maintenance path would generate a small amount of waste during construction. The boardwalk and maintenance path grading would require a similar volume of water as the proposed project for stabilization and irrigation of landscaped areas. The impact on service systems would be less than significant.

Comparison of Impacts to the Proposed Project
The Alternative 2 impact on utilities and service systems would be equivalent to the proposed project impacts and would be less than significant.

Agriculture and Forestry, Land Use and Planning, Mineral Resources, Population and Housing, and Wildfire
Alternative 2 Impacts
Alternative 2 would not involve impacts on land containing agricultural or forestry resources or mineral resources. Alternative 2 would not involve changes in land use or character of the community and would not conflict with the Town of Ross General Plan, Kentfield General Plan, or Marin Countywide Plan. Alternative 2 would not induce unplanned population growth, and planned growth would continue as under existing conditions. Alternative 2 would not involve any activities in a very high fire hazard area.

Comparison of Impacts to the Proposed Project
Alternative 2 would have equivalent temporary land use impacts to the proposed project, because of closure of Frederick Allen Park during construction and temporary physically dividing of a community by reduced access across Corte Madera Creek during construction. Alternative 2 agriculture and forestry, land use and planning, mineral resources, population and housing, and wildfire impacts would be equivalent to the proposed project.

Alternative 2 Summary, Feasibility, and Objectives
As discussed above and summarized in Table 5.4-1, Alternative 2 would result in reduced operational impacts and increased long-term benefits on biological resources, hydrology and water quality, hazards, recreation, and traffic and transportation, compared to the proposed project. Alternative 2 would cause equivalent significant and unavoidable impact to the proposed project on aesthetics, and less than significant with mitigation impacts on air quality, cultural resources, geology and soils, GHG emissions, noise, public services, tribal cultural resources, utilities and service systems, agriculture and forestry resources, minerals, land use and planning, population and housing, and wildfire. As described in Table 5.2-1, Alternative 2 would meet all feasibility criteria and all project objectives.

5.3.4 Alternative 3: Reduced Concrete

Description
Alternative 3 would include modification of several proposed project elements, reducing concrete in the project design in favor of natural materials. Alternative 3 would include constructing the retaining wall in Unit 4 and Frederick Allen Park using materials other than concrete, such as rocks or other material, to allow additional planting of vegetative material within the rocks or retaining wall. Alternative 3 also would replace the concrete transition structure at the connection between Units 3 and 4 with quarter- or half-ton rock, to protect the existing sanitary sewer line and stabilize the channel grade without use of concrete. Alternative 3 also would include constructing the additional floodwall segment within lower Unit 2 (downstream from College Avenue), using material such as rock or a soil-type barrier instead of

concrete. The natural floodwall would remain on the District's property but would be set back from the existing floodwall.

Environmental Impacts

Alternative 3 would involve construction of the same project elements as the proposed project, with the exception of the concrete retaining walls, concrete transition structure between Units 3 and 4, and the additional concrete floodwall in Unit 2, which would be replaced with non-concrete alternative materials. Construction of the natural material floodwall in Unit 2 could involve a larger footprint and require additional tree removal in comparison with the proposed project, because the new floodwall would be set back from the existing floodwall, whereas the proposed project would have an option of constructing a floodwall attached to the existing wall in Unit 2. The following resource impact discussions focus on the impacts from the construction approach or long-term impacts of Alternative 3 that would differ from the proposed project. All other potential environmental impacts from Alternative 3 would be the same as the proposed project, which are discussed in Chapter 3.

Aesthetics and Visual Resources

Alternative 3 Impacts

Alternative 3 would involve the use of natural materials, including imported rock and vegetation plantings, for construction of the retaining wall in Unit 4, the transition structure between Units 3 and 4, and the additional floodwall segment in Unit 2. The natural material retaining walls and floodwall would blend in with the materials of the stream environment and the visual impact of Alternative 3 would be less than significant.

Comparison of Impacts to the Proposed Project

Alternative would be more visually appealing than the proposed project concrete retaining walls and floodwall and would blend in with the vegetation in the natural creek channel in Unit 4 and surrounding vegetated areas. Alternative 3 would reduce the proposed project impact on visual quality in Frederick Allen Park by incorporating more natural materials to the landscape. However, Alternative 3 would not avoid removal of trees in Frederick Allen Park, and the significant and unavoidable impact on visual quality during the first 10 years after landscaping of the riparian habitat and floodplain would remain.

Air Quality and Greenhouse Gases

Alternative 3 would involve the use of construction equipment and vehicles that would result in temporary GHG emissions, similar to the proposed project. The amount of equipment and vehicle use, as well as fugitive dust and GHG emissions associated with Alternative 3 could be slightly higher than the proposed project because of the increased project footprint and associated number of truck trips for material import and export in Unit 2. Implementation of Mitigation Measure 3.2-1 would reduce the impacts to a less-than-significant level. The alternative would comply with all applicable BAAQMD rules and regulations and would not result in extended exposure of nearby residences to criteria air pollutants or toxic air contaminants. Operational air quality impacts would be the similar to the proposed project because maintenance activities are anticipated to be similar and infrequent.

Biological Resources

Alternative 3 could involve an increase in the number of trees removed in Unit 2 compared to the proposed project, because the natural material retaining wall would need to be set back from the existing wall. Under the proposed project, whether trees within a 15-foot setback from floodwalls would need to be removed to address Section 408 requirements is uncertain, whereas under Alternative 3, additional trees within the setback from the existing Unit 2 floodwall would need to be removed. All tree removal would be conducted in accordance with procedures defined in local tree ordinances, similar to the proposed project. The tree removal impact on habitat would be potentially significant. Implementation of Mitigation Measure 3.4-2b would require replanting trees that would be removed during construction of Alternative 3. The resulting impact from tree removal would be less than significant with mitigation incorporated. Alternative 3 would not conflict with any local policies or ordinances with respect to the additional tree removal because all tree removal for Alternative 3 would occur within Marin County. The impact regarding conflicts with local policies or ordinances would remain less than significant. Alternative 3 potentially could result in increased temporary impacts on biological resources than the proposed project because of increased tree removal in Unit 2. Because Alternative 3 would use natural materials and increase planting areas in the retaining walls in Units 3 and 4, it potentially could result in increased benefits to biological resources over the operational life of the project.

Cultural Resources

The Alternative 3 non-concrete elements would be in areas of proposed project disturbance. Alternative 3 would result in potential impacts on cultural resources equivalent to the proposed project because it would require grading and construction in the same areas as the proposed project and would have the same potential to disturb significant cultural resources. The impact would be less than significant with mitigation incorporated, as described in Chapter 3.

Energy

The intensity of construction and associated use of energy (fuel) for Alternative 3 would be slightly greater than the proposed project because of slightly increased import of material to construct the natural floodwall in Unit 3. The impact of increased material hauling for Alternative 3 would be less than significant.

Geology and Soils

Alternative 3 would include construction of project components on the same ground and soil substrate as the proposed project. Alternative 3 would require an increase in soil disturbing activities at Unit 2, including additional tree removal, which could result in increased soil loss in comparison with the proposed project. Implementation of BMPs associated with the SWPPP would minimize the potential impacts, and the impact from soil loss and erosion would remain less than significant, similar to the project. Alternative 3 could result in potentially significant impacts if the retaining wall or floodwall is not designed properly to address geologic hazards. Implementation of Mitigation Measure 3.6-1 would require a geotechnical investigation and implementation of geotechnical recommendations in the final design, to address any geologic hazards. The impact of Alternative 3 on geologic hazards would be less than significant with

mitigation incorporated. Alternative 3 potentially could increase geology and soils impacts relative to the project because of the increased area of ground disturbance than concrete retaining and floodwalls.

Hazards and Hazardous Materials
Alternative 3 would require use of the same volume, type, and quantity of hazardous materials as the proposed project. The impact from hazardous materials would be less than significant. Alternative 3 impacts on hazards and hazardous materials would be equivalent to the proposed project.

Hydrology and Water Quality
Alternative 3 would involve use of natural materials for the retaining wall in Units 3 and 4, the transition structure between Units 3 and 4, and the additional floodwall segment in Unit 2. The use of natural materials in constructing the retaining walls and floodwall would not violate any water quality standards, would not result in substantial erosion, and would not result in increased flood hazards. The impact on hydrology and water quality from use of natural materials would be less than significant. The use of natural materials would result in long-term potential benefits to hydrology and water quality in comparison with the proposed project. Use of natural materials rather than concrete at these locations would generate increased groundwater recharge. It would also allow increased vegetation planting, which would naturally retain and absorb water quality contaminants. Alternative 3 would involve similar benefits to flood reduction as the proposed project because the walls would be located in the same locations as the proposed project retaining walls and floodwalls and would have the same function as the proposed project retaining and floodwalls. Additional design and modeling of the Alternative 3 elements would be required, to fully evaluate the engineering feasibility of implementing non-concrete alternatives while protecting the RVSD pipeline and ensuring structural stability.

Noise
Construction of the natural material retaining walls in Units 3 and 4 and the natural floodwall in Unit 2 would require use of equivalent noise-generating construction equipment, just like the proposed project. The Alternative 3 retaining walls and floodwall are not located adjacent to structures and would result in less than significant vibration impacts. The noise impact from Alternative 3 retaining wall construction would be less than significant with mitigation, similar to the impact described for the project in Chapter 3.

Recreation
The Alternative 3 floodwall segment in Unit 2 would be set back from the existing floodwall, which would affect the unnamed and unofficial path #2 (see Section 3.12 and Figure 3.12-2 for the unofficial path location) that would occur in the Alternative 3 floodwall area. Temporary closure of the unofficial path would be required during construction, similar to the proposed project. The impact with respect to deterioration of nearby recreational facilities would be less than significant. Following construction, the unofficial path would remain inaccessible because of the presence of the natural floodwall. The increased use of the formal multi-use path (Bike

Route 20) because of rerouting of the access from the informal path would not increase deterioration of the bike path. The reduced informal recreational access on the left bank of Corte Madera Creek at the Alternative 3 floodwall would have a less than significant impact on recreational opportunities because recreational opportunities are available and would remain on the right bank of Corte Madera Creek. Alternative 3 would have greater impacts on recreation than the proposed project because the alternative would close recreational access to the left bank of Corte Madera Creek at the Unit 2 floodwall.

Transportation and Circulation

Alternative 3 elements would be in the Corte Madera Creek channel and outside any designated bike routes or roads. The Alternative 3 project elements would not conflict with any transportation or circulation plan. Alternative 3 would involve minimal vehicle miles traveled. The impact would be less than significant, similar to the proposed project. Construction, operation, and maintenance of the Alternative 3 non-concrete retaining and floodwalls would result in equivalent transportation impacts to the proposed project's concrete retaining and floodwalls.

Tribal Cultural Resources

Alternative 3 would include excavation and temporary ground disturbance in the same areas as the proposed project. The ground disturbance could affect tribal cultural resources, similar to the proposed project. Implementation of Mitigation Measure 3.5-2, which specifies procedures to avoid impacts on tribal cultural resources, would reduce the impact to a less-than-significant level with mitigation incorporated. Alternative 3 would have an equivalent potential to encounter and affect tribal cultural resources as the proposed project.

Utilities and Service Systems

Alternative 3 would not require or result in relocation or construction of new water conveyance, wastewater treatment, and stormwater drainage, or the addition of electric power, natural gas, or telecommunications facilities. Alternative 3 would protect the existing RVSD pipeline beneath Corte Madera Creek with large rock instead of concrete. If Alternative 3 is approved, additional design and engineering would be required to evaluate whether it would meet RVSD standards for pipeline protection. Because the Alternative 3 design would be subject to conformance with RVSD engineering standards and RVSD review and approval, the impact on the RVSD pipeline would be less than significant. Alternative 3 would require an equivalent amount of water and would generate an equivalent volume of solid waste as the proposed project concrete structures. The impact would be less than significant. Alternative 3 maintenance would generate similar quantities of waste and use of water to the proposed project. The maintenance impact would be less than significant. Thus, Alternative 3 would result in an equivalent impact on utilities and service systems to the proposed project.

Agriculture and Forestry, Land Use and Planning, Mineral Resources, Population and Housing, and Wildfire

Alternative 3 would not involve impacts on land containing agricultural or forestry resources or mineral resources. Alternative 3 would not involve changes in land use or character of the

community and would not conflict with the Town of Ross General Plan, Kentfield General Plan, or Marin Countywide Plan. Alternative 3 would not induce unplanned population growth, and planned growth would continue as under existing conditions. Alternative 3 would not involve any activities in a very high fire hazard area. Alternative 3 would have no impact on land use and population and housing and the impact would be equivalent to the proposed project retaining walls and floodwall in Unit 2.

Alternative 3 Summary, Feasibility, and Objectives

Alternative 3 would result in a slight reduction in long-term aesthetic, biological, and hydrology and water quality impacts than the proposed project because of the reduction in concrete and use of natural materials in the Corte Madera Creek channel and floodplain. Alternative 3 could result in a slight temporary increase in air quality, GHG emissions, and energy (fuel) impacts during construction because of increased import of material to construct the Unit 2 floodwall using natural materials. Alternative 3 would result in equivalent impacts to the proposed project on cultural resources, geology and soils, hazards and hazardous materials, noise, public services, recreation, transportation and traffic, tribal cultural resources, utilities and service systems, agriculture and forestry resources, minerals, land use and planning, population and housing, and wildfire. As described in Table 5.2-1, Alternative 3 would meet all feasibility criteria and all project objectives.

5.4 Comparison of Alternatives

Table 5.4-1 summarizes the impacts of each alternative on the environmental resources evaluated in the Draft EIR. The significance determination (e.g., less than significant with mitigation [LTSM]) for each alternative reflects the impact that would result from implementation of the alternative project components in combination with the proposed project components in areas that are not modified by the alternative.

Table 5.4-1 Comparison of Alternatives and Environmental Considerations

Topic	Proposed Project	No Project Alternative	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)	Alternative 3: Reduced Concrete (with proposed project in other areas)
Aesthetics and Visual Resources	LTS impact on scenic vistas. SU impact on visual quality (years 0 to 10); long-term beneficial impact on visual quality	No Impact	LTS The alternative would avoid the SU impact on visual quality from removal of trees in Frederick Allen Park. The alternative would not achieve the long-term benefits on visual quality because the existing concrete channel would remain.	SU = The alternative would have similar impacts on visual quality during the first 10 years of vegetation establishment at Frederick Allen Park. The alternative could result in greater benefits to visual quality from increased landscaping.	SU < The alternative would have similar impacts on visual quality during the first 10 years of vegetation establishment at Frederick Allen Park. The alternative could result in greater benefits to visual quality from use of natural materials and plants in lieu of concrete.
Air Quality	LTSM impact from air quality emissions and exposure to substantial pollutant concentrations LTS impact from conflict with an air quality plan and resulting in other emissions affecting a substantial number of people	No Impact	LTSM < The alternative would result in reduced emissions from reduced construction it still would require implementation of mitigation to avoid a potentially significant impact from substantial pollutant concentrations.	LTSM = The alternative would result in equivalent construction activity and emissions to the proposed project.	LTSM > The alternative would result in a slight increase in construction activity and emissions in Unit 2 as compared to the proposed project, though impacts would remain less than significant.

Topic	Proposed Project	No Project Alternative	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)	Alternative 3: Reduced Concrete (with proposed project in other areas)
Biological Resources	LTSM impact on special-status species, riparian and sensitive natural communities, wetlands, conflicts with ordinance for protection of biological resources, and introduction of invasive species	No Impact: existing fish passage barriers would remain.	LTSM > The alternative would avoid short-term impacts from tree removal in Frederick Allen Park but would not achieve the long-term benefits to water quality and habitat from removal of the concrete channel and creation of a natural riparian habitat.	LTSM < The alternative would reduce the long-term impact from recreational access to the creek. The boardwalk would allow habitat creation underneath the boardwalk.	LTSM < The alternative would reduce the impact from new concrete structures in the Corte Madera Creek channel and floodplain.
Cultural Resources	LTSM impact on archaeological resources LTS impact on human remains	No Impact	LTSM < The alternative would have a low potential to encounter archaeological resources or human remains. The impact would be slightly less than theproposed project due to the reduced area of grading/earthwork.	LTSM = The alternative would have a low potential to encounter archaeological resources or human remains. The impact would be equivalent to the proposed project.	LTSM = The alternative would have a low potential to encounter archaeological resources or human remains. The impact would be equivalent to the proposed project.
Energy	LTS impact on energy supplies	No Impact	LTS < The alternative would require less energy use during construction	LTS = The alternative would require an equivalent amount of energy use to	LTS > The alternative could require slightly more energy to construct because of the potential

Topic	Proposed Project	No Project Alternative	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)	Alternative 3: Reduced Concrete (with proposed project in other areas)
			because of reduced construction activity.	construct as the proposed project.	increased hauling of materials to construct the Unit 2 floodwall.
Geology and Soils	LTSM impact from geologic hazards LTS impact from loss of topsoil	No Impact	LTSM < The reduced construction area would have slightly less potential to cause geology and soils-related impacts from construction-related erosion and topsoil loss than the proposed project.	LTSM = The impact of geologic hazards from construction of a boardwalk would be equivalent to the impact from proposed project construction.	LTSM > The impact from geologic hazards and soil loss from construction of the non-concrete floodwall would be slightly greater than the proposed project.
Greenhouse Gas (GHG) Emissions	LTS impact from GHG emissions	No Impact	LTS < The reduced construction in Frederick Allen Park would result in reduced GHG emissions.	LTS = The construction intensity would be similar to the proposed project and would have similar GHG emissions.	LTS > The floodwall construction in Unit 2 would result in slightly greater hauling of material and slightly increased GHG emissions, compared to the proposed project.
Hazards and Hazardous Materials	LTS impact from transport and use of hazardous materials and flooding hazards	No Impact	LTS < The reduced area of construction would require slightly less use	LTS < Compared to the proposed project, the alternative would require	LTS = The alternative would require an equivalent volume of hazardous

Topic	Proposed Project	No Project Alternative	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)	Alternative 3: Reduced Concrete (with proposed project in other areas)
			of hazardous materials and would not increase flooding of the bike path, compared to the proposed project.	an equivalent volume of hazardous materials (fuel) to construct. The alternative would avoid increased flooding of the bike path.	materials (fuel) to construct, compared to the proposed project. The alternative would not change exposure of the public to flood hazards.
Hydrology and Water Quality	LTSM impact from violation of water quality standards LTS impact on erosion and from flooding hazards	No Impact: ongoing flooding consequences would remain	LTSM > The alternative would avoid the impact from excavation and exposure of potentially contaminated soils. The alternative would result in greater, but LTS, long-term impacts on flooding on properties adjacent to Frederick Allen Park.	LTSM < The alternative would elevate the bike path above the floodplain and lessen the risk of flooding, compared to the proposed project. The alternative also would reduce the use of impervious surfaces.	LTSM < The alternative would result in a slight reduction in water quality impacts because of the use of natural materials in lieu of concrete.
Noise	LTSM impact from noise generation exceeding noise ordinances and generation of groundborne vibration	No Impact	LTSM < The alternative would avoid construction in Frederick Allen Park and would eliminate the associated potentially significant increase in noise levels and groundborne vibration.	LTSM = The alternative would require an equivalent level of grading and construction activity and would result in similar noise and vibration, compared to the proposed project.	LTSM = The alternative would require an equivalent level of grading and construction activity and would result in similar noise and vibration, compared to the proposed project.

Topic	Proposed Project	No Project Alternative	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)	Alternative 3: Reduced Concrete (with proposed project in other areas)
Public Services	LTS impact on police, fire department, and other public services	No Impact	LTS = The alternative would have equivalent impacts on public services, compared to the proposed project.	LTS = The alternative would have equivalent impacts on public services, compared to the proposed project.	LTS = The alternative would have equivalent impacts on public services, compared to the proposed project.
Recreation	LTSM impact on recreational opportunity from reduced shade LTS impact from new recreational access and associated public access impacts on the creek	No Impact	LTS < The alternative would reduce the impact on recreational access because of avoidance of construction activities and modifications in Frederick Allen Park.	LTSM < The alternative would avoid impacts associated with public access to the creek and would reduce impacts on recreational access because the boardwalk would be elevated above the floodplain. The impact from loss of shade would be equivalent to the proposed project.	LTSM > The alternative would not modify any proposed project elements in Frederick Allen Park. The alternative would block access to an unofficial path at the location of the non-concrete floodwall in Unit 2 The impact would be greater than the proposed project.
Transportation and Circulation	LTSM impact from temporary closure of Bike Route 20 during construction in Frederick Allen Park LTS impact on vehicle miles traveled	No Impact	LTS < The alternative would avoid closure of Bike Route 20 and associated temporarily significant impacts on bicycle and pedestrian facilities,	LTSM < The alternative would result in equivalent short-term construction impacts for the new boardwalk in Frederick Allen Park. The boardwalk would be elevated above the	LTSM = The alternative would not change any project elements that would affect transportation.

Topic	Proposed Project	No Project Alternative	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)	Alternative 3: Reduced Concrete (with proposed project in other areas)
			unlike the proposed project.	floodplain and would reduce potential long-term impacts on bicycle access because of reduced flooding.	
Tribal Cultural Resources	LTSM impact on tribal cultural resources from inadvertent discovery	No Impact	LTSM = Would involve construction in areas with low potential to encounter tribal cultural resources, similar to the proposed project.	LTSM = Would involve construction in areas with low potential to encounter tribal cultural resources, similar to the proposed project.	LTSM = Would involve construction in areas with low potential to encounter tribal cultural resources, similar to the proposed project.
Utilities and Service Systems	LTS impact from relocation or construction of new utilities and exceedance of water supply, wastewater, or solid waste capacity	No Impact	LTS < The reduced construction area would result in slightly reduced temporary demand for utilities and service systems.	LTS = The alternative would have a comparable impact on utilities and service systems to the proposed project.	LTS = The alternative would have a comparable impact on utilities and service systems to the proposed project assuming that the rock protection of the RVSD sewer line is adequate.
Agriculture and Forestry, Land Use and Planning, Mineral Resources, Population and	No impact on agriculture and forestry, land use, minerals, and wildfire LTS impact on dividing an established	No Impact	No Impact < The alternative would avoid the temporary impact from dividing an established community because Frederick Allen	LTS = The alternative would result in the same impacts as the proposed project during	LTS = The alternative would result in the same impacts as the proposed project during

Topic	Proposed Project	No Project Alternative	Alternative 1: Reduced Footprint–Avoid Frederick Allen Park (with proposed project in other areas)	Alternative 2: Maintain Elevation of Bike Route 20 in Frederick Allen Park and No Creek Access (with proposed project in other areas)	Alternative 3: Reduced Concrete (with proposed project in other areas)
Housing, and Wildfire	community during construction		Park would remain open during construction.	construction in Frederick Allen Park.	construction in Frederick Allen Park.

Notes:

LTS = Less than significant impact

LTSM = Less than significant impact with mitigation incorporated

SU = Significant and unavoidable impact

< = alternative would reduce one or more impacts of the proposed project.

> = alternative would increase one or more impacts of the proposed project.

= = the proposed project and alternative impacts would be equivalent.

5.5 Environmentally Superior Alternative

CEQA requires that an environmentally superior alternative be identified. The environmentally superior alternative is the alternative that would result in the fewest or least significant environmental impacts while providing the greatest environmental benefits. If the No Project Alternative is the environmentally superior alternative, Section 15126.6(e)(2) of the CEQA Guidelines requires that another alternative that feasibly could attain most of the project's basic objectives be chosen as the environmentally superior alternative.

Although the No Project Alternative would avoid the short-term impacts of project construction, the No Project Alternative would result in a continuation of the existing flooding hazards throughout the Town of Ross and Kentfield area. This existing flooding hazard is a significant detriment to public safety and property. The No Project Alternative also would not address the lack of fish resting pools and insufficient fish and riparian habitat within the Corte Madera Creek concrete channel. These existing habitat impacts are significant. Although Alternative 1 would avoid the proposed project's significant and unavoidable short-term impact on visual quality during the first 10 years after construction, Alternative 1 would result in additional flooding impacts in the Town of Ross during the 100-year flood event and would have substantially reduced habitat benefits than the proposed project.

Alternative 2 would be the environmentally superior alternative because it would avoid the impacts related to recreation, hazards, and transportation from increased flooding on Bike Route 20. Alternative 2 also would reduce the LTS impact from creating a new pedestrian access to the creek and would allow increased riparian planting and infiltration of rainfall due to construction of an elevated boardwalk instead of a paved pathway. Alternative 2 also would meet all project objectives and feasibility criteria.

5.6 References

GHD. (2020, October 23). Scenario B2 Hydraulic Modeling.

Stetson Engineers. (2017). *Report on Hydraulic Modeling of Corte Madera Creek Option C for the Phoenix Lake.*

USACE. (2010). *Corte Madera Creek Flood Control Study Baseline Report.* San Francisco, CA: U.S. Army Corps of Engineers, San Francisco District.

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6 Report Preparation

6.1 List of Preparers

This section lists those individuals who either prepared or participated in the preparation of this EIR. The District and Town of Ross are serving as the CEQA lead agency and responsible agency for preparation of this EIR, respectively.

6.1.1 Marin County

Table 6.1-1 lists the individuals from the District that were involved in the preparation of this EIR.

Table 6.1-1 Marin Flood Control District and Planning Department

Contributor	Title
Marin County Flood Control and Water Conservation District	
Joanna Dixon	Project Manager
Liz Lewis	Water Resources Manager
Laurie Williams	Senior Planner
Liz Lotz	Resource Specialist GIS
Marin County Planning Department	
Rachel Reid	Planning Manager

6.1.2 Consultant Team

Consulting staff that contributed to this EIR are listed in Table 6.1-2.

Table 6.1-2 Consultant Teams

Contributor	Title	Role/Resource Section
Panorama Environmental, Inc.		
Susanne Heim	Project Manager	Quality Assurance/Quality Control, Project Description, Alternatives, Public Outreach, Project Management
Stephanie Klock	Deputy Project Manager	Project Management, Quality Control
Rita Wilke	Senior Environmental Scientist	Project Description, Alternatives

Contributor	Title	Role/Resource Section
Whitney Broeking	Senior Environmental Scientist	Aesthetics and Visual Resources, Recreation
Caitlin Gilleran	Senior Environmental Scientist	Air Quality and Greenhouse Gas Emissions
Geoff Hornek	Noise Specialist	Noise measurements and modeling
Christina Kossa	Visual Specialist	Visual Simulations
Corey Fong	GIS Manager	GIS, Graphics
Tali Ashurov	Environmental Planner II	Agriculture and Forestry, Energy, Land Use and Planning, Population and Housing, Public Services, Transportation and Circulation, Utilities and Service Systems
Yingying Cai	Environmental Planner I	Geology and Soils, Hazards and Hazardous Materials, Mineral Resources, Noise, Socioeconomics, Wildfire, Growth-Inducing and Cumulative
GHD		
Raymond Wong, Ph.D.	Sr. Engineer/Project Manager	Engineering, Hydraulic Modeling, Project Management, Project Description
Seth Stevens	Civil Engineer	Engineering, Project Description
Tonya Redfield	Senior Project Manager	Project Management
Greg Garrison	Civil Engineer/Hydrologist	Hydraulic Modeling
Jessica Hall	Landscape Architect	Visual Simulation, Planting Plan
Horizon Water and Environment		
Ken Schwarz, Ph.D.	Principal	Hydrology
Brian Piontek	Senior Associate	Hydrology
Johnnie Chamberlin	Associate	Hydrology
Jennifer Schulte, Ph.D.	Air Quality Expert	Health Risk Assessment
Janis Offerman, RPA	Director Cultural Resources	Cultural Resources and Tribal Cultural Resources
Stillwater Sciences		
Dennis Halligan	Senior Fisheries Biologist	Biological Resources – Aquatic
Megan Keever	Senior Botanist	Biological Resources - Plants
Holly Burger	Senior Wildlife Biologist	Biological Resources - Terrestrial Wildlife
Mike Love & Associates		
Mike Love	Principal Engineer	Fish passage evaluation/design

Contributor	Title	Role/Resource Section
Sicular Consulting		
Dan Sicular	Principal	EIR Review

6.2 Agencies and Organizations Contacted

Federal, state, and local agencies and tribes consulted during the preparation of the EIR are listed in Table 6.2-1.

Table 6.2-1 Agencies and Organizations Consulted

Agency or Organization	Person Consulted
Federal	
United States Army Corps of Engineers	Nicholas Malsavage Duke Roberts Holly Costa John Conway Roberta Morganstern
National Marine Fisheries Services	Sara Azat
State	
California Department of Fish and Wildlife	Mandy Culpepper Karen Weiss
Regional Water Quality Control Board	Nicole Fairley
State Lands Commission	Eric Gillies
Local	
Town of Ross	Richard Simonitch Joe Chinn Patrick Streeter
Ross Valley Sanitation District	Stephen Miksis Steve Moore Philip Benedetti
Non-Governmental Organization	
Friends of Corte Madera Creek	Sandra Guldman Nick Salcedo
Tribes	
Federated Indians of Graton Rancheria	Buffy McQuillen

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