DRAFT EIR

for the

BELVEDERE SEISMIC UPGRADE PROJECT

STATE CLEARINGHOUSE NUMBER 2022010159

Prepared for

City of Belvedere

October 2022

Prepared by

Amy Skewes-Cox, AICP

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In conjunction with

BASELINE ENVIRONMENTAL CONSULTING
ECORP CONSULTING
ENVIRONMENTAL COLLABORATIVE
NATALIE MACRIS
PARISI TRANSPORATION CONSULTING
TOM CAMARA GRAPHICS
WORDSMITH WORD PROCESSING

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1. INTRODUCTION

This document is an Environmental Impact Report (EIR) for the Belvedere Seismic Upgrade Project (project or BSUP) proposed by the City of Belvedere. This EIR has been prepared in accordance with the California Environmental Quality Act of 1970 (CEQA), as amended.

CEQA requires that, before a project with potentially significant environmental effects may be approved, an EIR must be prepared that fully describes the environmental effects of the project, identifies mitigation measures to lessen or eliminate adverse impacts, and examines feasible alternatives to the project (CEQA Guidelines Section15121(a)). An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information that enables them to make a decision that intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure (CEQA Guidelines Section15151).

This EIR is intended to provide the information and environmental analyses necessary to help the public understand the project and its likely environmental consequences, and to assist public agency decision-makers in considering the approvals necessary to implement the proposed project. As required by Section 15125(a) of the CEQA Guidelines, the EIR addresses "baseline" conditions, which are the physical environmental conditions at the project site and vicinity that exist at the time of publication of the Notice of Preparation (NOP) (see Appendix A).[1] The project impacts are then evaluated in comparison to these baseline conditions. In identifying the significant impacts of the project, this EIR focuses on the project's significant physical effects and on mitigation measures to avoid, reduce, or otherwise alleviate those effects. This EIR also describes and analyzes a reasonable range of alternatives, including a "No Project" alternative as required under CEQA (CEQA Guidelines Section15126.6). The determinations of the lead agency concerning the feasibility, acceptance, or rejection of each and all alternatives considered in this EIR will be addressed and resolved in the City's findings when it considers approval of the project, as required by CEQA.

1.1 PROJECT SUMMARY

The BSUP would install sheet piles within and near the San Rafael Avenue and Beach Road rights-of-way, which are situated on levees. Sheet piling would stabilize the levees and provide substantial protection against deformation during a strong earthquake. By stabilizing the levees, access for evacuation and emergency vehicles would be maintained and utilities buried under the roads would be protected. These utilities include water pipelines, wastewater pipelines,

[1] The Notice of Preparation prepared for the project and distributed on January 11, 2022 addressed a project that included the proposed sheet piles as well as strengthening and raising the levees/embankments along San Rafael Avenue and Beach Road and improving public walkways affected by the project. This levee or floodwall component has now been removed from the project, and only the proposed sheet piles are addressed in this EIR.

gas/electrical lines, and internet/phone lines that are all maintained by public agencies and private utilities other than the City of Belvedere.

1.2 PUBLIC REVIEW

This Draft EIR will be circulated for review and comment by the public and other interested parties, agencies, and organizations for a 45-day period as indicated on the Public Notice of Availability of this document. During the public review period, written comments on the adequacy of the Draft EIR may be submitted to:

Mr. Robert Zadnik, City Manager
City of Belvedere
450 San Rafael Avenue
Belvedere, CA 94920

Written comments via email can be sent to Mr. Zadnik at EIRcomments@cityofbelvedere.org. All email correspondence should state "BSUP EIR Comments" in the subject line.

Responses to all substantive comments received on the adequacy of the Draft EIR and submitted within the specified review period will be prepared and included in the Responses to Comments/ Final EIR. Prior to approval of the project, the City must certify the Final EIR and adopt a Mitigation Monitoring and Reporting Program (MMRP) for mitigation measures identified in the EIR, in accordance with the requirements of California Public Resources Code (PRC) Section 21001.

1.3 ORGANIZATION OF THE EIR

This Draft EIR is organized into the following chapters:

Chapter 1, Introduction: Provides an introduction and overview that describes the intended use of this EIR, project background, the EIR process, and organization of the document.

Chapter 2, Summary: Briefly describes the project and concerns associated with it, identifies levels of significance for each impact addressed in the EIR, summarizes the environmental effects of the project, identifies applicable mitigation measures, and compares impacts of the project with those of alternatives to the project. Table 2-1, Summary of Environmental Impacts and Mitigation Measures, is provided at the end of Chapter 2.

Chapter 3, Project Description: Contains information on the project site, project objectives, and project characteristics.

Chapter 4, Environmental Setting, Impacts, and Mitigation Measures: Contains an analysis of environmental topics. Each topic is addressed in a separate section. Each section is divided into an *Introduction* that describes the general content and approach used for the topic; an *Environmental Setting* subsection that describes baseline environmental information; a *Regulatory Framework* subsection that describes federal, state, and local regulations applicable to the topic; an *Environmental Impacts and Mitigation Measures* subsection that describes project-specific impacts

and mitigation measures, along with cumulative impacts; and a *References* subsection that lists reference materials used in preparing the analysis.

Chapter 5, Alternatives: Assesses impacts of two alternatives to the project, consisting of a No Project Alternative and a Mitigated Alternative. The alternatives are compared to the proposed project and an "Environmentally Superior Alternative" is identified.

Chapter 6, Other CEQA Considerations: Contains sections required by CEQA, including discussion of cumulative impacts, growth inducement, and significant unavoidable impacts.

Chapter 7, EIR Authors: Lists the persons directly involved in preparing this report.

Chapter 8, References: Lists the persons, agencies, and organizations contacted and documents used during preparation of this report.

Appendices:

Appendix A	Notice of Preparation and Comment Letters for Notice of Preparation
Appendix B	Air Quality Data
Appendix C	Construction Management Plan
Appendix D	Public Comments Made at Scoping Meeting of February 9, 2022
Appendix E	Noise Data

1.4 NOTICE OF PREPARATION

A Notice of Preparation (NOP) was prepared on January 11, 2022 by the City of Belvedere, as lead agency, to obtain comments from agencies and the public regarding issues to be addressed in the EIR. The date of the NOP, January 11, 2022, is the date assumed for the "baseline" conditions against which the environmental impacts of the project are analyzed. The NOP is included in Appendix A and can also be viewed on the City's website at the following address: https://www.cityofbelvedere.org/DocumentCenter/View/7791/Final-NOP-Critical-Infrastructure-Project-1?bidId=

The NOP was circulated for public review for 30 days between January 11, 2022, and February 10, 2022 (see Appendix A). Copies of the comments received in response to the NOP are included in Appendix A of this EIR. As stated in the NOP, the City determined that the following environmental factors would not warrant further discussion in the EIR because they are not applicable to the project or project site:

- Agriculture and Forestry Resources: No farmland or forest land is located at the project site.
- Mineral Resources: The project would not result in the loss of a known mineral resource or any such resource designated in a general plan, specific plan, or other land use plan.

- Population and Housing: The project would not induce substantial population growth, nor would it displace people or housing.

This EIR was prepared based on the comments received on the NOP and the project information provided. The following topics were found to have potential environmental impacts and thus are addressed in this EIR:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology/Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Public Services
- Recreation
- Transportation/Traffic
- Tribal Cultural Resources
- Utilities and Service Systems

The NOP prepared for the project and distributed on January 11, 2022, addressed a project that included the proposed sheet piles for strengthening the San Rafael Avenue and Beach Road levees. The project addressed in the NOP also called for increasing the height of existing seawalls along the levees while simultaneously improving public walkways and related public areas affected by the project. This potential future project is now referred to as the Flood Barrier Project. Since issuance of the NOP, in response to community concerns, the City decided to remove the Flood Barrier Project from the currently proposed project. The sheet piling project is independent from the Flood Barrier Project and, as such, it can be evaluated separately in a document that conforms to CEQA. If and when the Flood Barrier Project is proposed, a future CEQA document would be required for that project. In this EIR, the Flood Barrier Project is briefly addressed as part of the cumulative analysis found near the end of each topic section in *Chapter 4, Environmental Setting, Impacts, and Mitigation Measures*.

2. SUMMARY

This chapter briefly describes the proposed project and summarizes the project-specific impacts and mitigation measures identified in this Environmental Impact Report (EIR) (see Table 2-1). This chapter also summarizes alternatives to the project that are considered in this EIR.

2.1 PROJECT UNDER REVIEW

This EIR evaluates the Belvedere Seismic Upgrade Project (BSUP or project), a City of Belvedere proposal to install sheet piling along specific segments of San Rafael Avenue and Beach Road in an area of existing levees. Soils comprising the levees upon which these two main roads were built consist primarily of intermixed sands and Bay mud layers produced from the dredging process that established the Belvedere Lagoon and levees. These layers are prone to liquefaction in an earthquake. In the event of an earthquake, liquefaction could cause the levees to deform. The proposed sheet piles would counteract this effect and stabilize the levees to maintain road access for emergency vehicles.

The Notice of Preparation (NOP) prepared for the project and distributed on January 11, 2022 (see Appendix A) addressed a project that included the proposed sheet piles for strengthening the San Rafael Avenue and Beach Road levees. The project addressed in the NOP also called for increasing the height of existing seawalls along the levees while simultaneously improving public walkways and related public areas affected by the project. This potential future flood barrier improvements are now referred to as the Flood Barrier Project. Since issuance of the NOP, in response to community concerns, the City decided to remove the proposed flood barrier improvements from the currently proposed project. The BSUP is independent from the Flood Barrier Project and, as such, it can be evaluated separately in a document that conforms to the California Environmental Quality Act (CEQA). If and when the Flood Barrier Project is proposed, it would be analyzed under a separate CEQA document. In this EIR, the Flood Barrier Project is briefly addressed as part of the cumulative analysis found near the end of each topic section in *Chapter 4, Environmental Setting, Impacts, and Mitigation Measures*.

2.2 AREAS OF POTENTIAL CONTROVERSY

A Notice of Preparation (NOP) was prepared by the City of Belvedere to obtain comments from agencies and the public regarding issues to be addressed in the EIR. The NOP can be viewed on the City's website, at the following address: https://www.cityofbelvedere.org/DocumentCenter/View/7791/Final-NOP-Critical-Infrastructure-Project-1.

The NOP was circulated for public review for 30 days between January 12, 2022, and February 9, 2022. Copies of the comments received in response to the NOP are included in Appendix A of this EIR.

The EIR was prepared based on the comments received on the NOP and the project information provided. While many of the NOP comments addressed the proposed flood barrier improvements

that were originally part of the project, these comments have not been addressed herein since the project now only includes the proposed new sheet piles. The comments on the NOP addressed concerns related to the following:

- Biological impacts related to nesting birds, protected species, San Francisco Bay habitat, fish habitat and other biological issues.
- Emergency access and blockage of roadways.
- Aesthetic impacts.
- Sea level rise assumptions.
- Coordination with Tiburon.
- Construction scheduling.
- Alternatives to the seawall such as flood barrier, rip rap, and wave deflection systems.
- Construction impacts on residents and businesses.
- Noise, aesthetic, and other impacts on park areas on Beach Road.
- Americans with Disabilities Act (ADA) requirements along Beach Road.
- Impacts on utility lines.
- Potential need for sheet piles on both the north and south sides of Beach Road.
- Historic structure impacts.
- Need for tribal consultation.
- Lack of Tiburon seawall that would affect Belvedere properties.
- Potential damage to homes from sheet pile installation.
- Danger from removal of Beach Road median.
- Impacts on roads and utilities from sheet pile construction.
- Potential narrowing of roadways.
- Conflict of project engineer working on EIR.
- Impacts of raising seawall on traffic, pedestrians, and the visual environment.
- Construction traffic impacts.

A scoping meeting was held online on February 9, 2022, and the verbal comments made at that meeting addressed the following:

- Conflict of interest with the project engineer preparing the Hydrology section of the EIR;
- Concern about sheet piles and vibration impacts associated with sheet pile installation;
- Possible need for more sheet piles on San Rafael Avenue where settlement may occur; and
- Need to define permitting timing.

The following topics were found to have potential impacts and thus are addressed in this EIR:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Energy

- Geology/Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Public Services
- Recreation
- Transportation/Traffic
- Tribal Cultural Resources
- Utilities and Service Systems

2.3 IMPACTS AND MITIGATION MEASURES

Under CEQA, a significant effect on the environment is defined as a substantial or potentially substantial adverse change in any of the physical conditions within the area affected by a project, including effects on land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance (CEQA Guidelines Section 15382). In this EIR, the criteria used to determine whether effects are significant are included in the *Environmental Impacts and Mitigation Measures* subsection in each topic section in *Chapter 4, Environmental Setting, Impacts, and Mitigation Measures*.

All potential impacts identified for the project could be mitigated to a less-than-significant level.

Prior to approval of the project, written findings regarding each of the identified environmental impacts must be prepared. Also, a monitoring program for the mitigation measures must be adopted. This monitoring program will be prepared as part of the Final EIR for this project.

2.4 ALTERNATIVES TO THE PROJECT

Two alternatives to the proposed project are evaluated in *Chapter 5, Alternatives*: Alternative 1–No Project and Alternative 2–Use of Silent Pile Drivers. The environmental impacts of each alternative are compared to those of the proposed project. The ability of each alternative to meet project objectives is also evaluated. In addition to the No Project Alternative, Alternative 2 would be the environmentally superior alternative.

2.5 SUMMARY TABLE

Table 2-1 summarizes project impacts and mitigation measures. The table identifies each impact's level of significance both before and after mitigation.

TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
Aesthetics			
The project would have no potentially significant aesthetic impacts.			
Air Quality			
AIR-1: The project would result in the generation of fugitive dust PM_{10} and $PM_{2.5}$ emissions from soil disturbance activities that could result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment.	PS	AIR-1: During project construction, the contractor shall implement a dust control program that includes the following measures recommended by the Bay Area Air Quality Management District (BAAQMD) and these measures shall be included in contract specifications for construction of the project: ▪ All exposed surfaces (e.g., parking areas, 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 miles per hour (mph). ▪ All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. ▪ Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 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. ▪ All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. ▪ A publicly visible sign shall be posted with the telephone number and person to contact at the City of Belvedere 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. Implementation of these measures would ensure that emissions of coarse particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$) from dust generated during project construction activities would not result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment, and this impact would be less than significant.	LTS

PS = Potentially Significant; LTS = Less Than Significant; SU = Significant and Unavoidable

TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
Biological Resources			
BIO-1: Special-status fish species could be adversely affected by proposed construction in the intertidal zone of Belvedere Cove.	PS	BIO-1a: Appropriate construction controls and restrictions shall be taken to prevent inadvertent loss of special-status fish species and other aquatic life as a result of construction activities within or near areas of tidal influence and open water habitat of San Francisco Bay to avoid possible inadvertent take of Central California Coastal steelhead, green sturgeon, Central Valley spring-run chinook salmon, and longfin smelt, if present in the area during the time of construction. This shall be accomplished through implementation of the following provisions: ▪ Adequate measures shall be taken to minimize disturbance and sedimentation in aquatic habitat of the bay and Belvedere Lagoon. These measures shall include installing turbidity curtains around in-water construction zones, restricting in-water operations to low tide periods, lowering surface water elevations in the Belvedere Lagoon during sheet pile installation, and timing restrictions for in-water construction, among other possible controls and restrictions. ▪ Preconstruction clearance surveys shall be conducted by a qualified biologist for any in-water construction as called for in Mitigation Measure BIO-1b. ▪ Any pumping as part of dewatering construction areas shall be adequately screened according to the latest screening guidelines of the California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS) to prevent entrainment of special-status fish and other aquatic life during the pumping operation. ▪ Any in-water construction activities shall be restricted to the period from June 1 through October 31, when stray or dispersing special-status fish species would most likely not be expected within the affected areas. ▪ All construction work within regulated waters shall be restricted to daylight hours to avoid disturbing aquatic habitat with artificial light source that could attract fish and other wildlife into the construction zone.	LTS
		BIO-1b: Prior to initiation of grading or vegetation removal, a qualified biologist shall be retained to train workers on the regulations related to jurisdictional waters, special-status species, and the possible risk of inadvertent take in advance of construction. The qualified biologist shall be someone knowledgeable about the biology and regulations regarding jurisdictional waters, as well as protected species known or with the potential to occur in or adjacent to the project site, including steelhead, Chinook salmon, green sturgeon, and longfin smelt. The following provisions shall apply: ▪ The qualified biologist shall oversee installation of turbidity curtains, conduct preconstruction surveys for nesting birds as required in Mitigation Measure BIO-2, and inspect the construction zone in tidal areas, as necessary.	

PS = Potentially Significant; LTS = Less Than Significant; SU = Significant and Unavoidable

TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		▪ The worker training shall be conducted prior to starting work on the project and upon the arrival of any new worker into the tidal zone. The training program shall include a description of protected species and their habitat needs, any known occurrences in the site vicinity, an explanation of the status of these species and their protection under state and federal legislation, a description of regulated waters and the need to follow all regulatory authorizations, a list of measures being taken to avoid and minimize impacts to protected species during the work, and procedures to follow if a protected species is discovered to be present in the work area. ▪ Fact sheets containing the information presented during the worker training program shall be provided to the Project Foreman and kept on-site for the duration of construction. ▪ The qualified biologist shall train the Project Foreman to serve as an Environmental Monitor who will make sure workers are following all required controls, inspect the construction zone and condition of turbidity curtains to confirm they are functioning, and check for any signs of protected species. ▪ A record of all personnel trained during the project shall be maintained for compliance verification.	
		BIO-1c: The City of Belvedere shall obtain all necessary authorizations from the CDFW, NMFS, and USFWS as required by federal and state law for potential harm to special-status fish species. Such authorization would be obtained through interagency coordination in accordance with the U.S. Army Corps of Engineers Section 404 consultation and the CDFW Section 2081 Incidental Take Permit process. The project shall adhere to any additional conditions and restrictions required as part of the authorizations from regulatory agencies. This shall include any required compensatory mitigation for the permanent loss of an estimated 1,200 square feet (0.03 acre) of benthic habitat at the base of the existing seawall, provided at a minimum 1:1 ratio or as negotiated with the regulatory agencies. The combination of the above measures would reduce this potential impact to less than significant.	
BIO-2: Project implementation may result in adverse impacts on nesting birds, if present in the site vicinity during construction.	PS	BIO-2: Adequate measures shall be taken to avoid inadvertent take of raptor nests and other nesting birds protected under the Migratory Bird Treaty Act and California Fish and Game Code when nests are in active use. This shall be accomplished by taking the following steps. ▪ If construction is proposed during the nesting season (February through August), a focused survey for nesting raptors and other migratory birds shall be conducted by a qualified biologist within 14 days prior to the onset of vegetation removal or	LTS

PS = Potentially Significant; LTS = Less Than Significant; SU = Significant and Unavoidable

TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		construction, in order to identify any active nests on the project site and in the vicinity of proposed construction. ▪ If no active nests are identified during the survey period, or if development is initiated during the non-breeding season (September through January), construction may proceed with no restrictions. ▪ If active nests are found, an adequate setback shall be established around the nest location and construction activities restricted within this no-disturbance zone until the qualified biologist has confirmed that any young birds have fledged and are able to function outside the nest location. Required setback distances for the no-disturbance zone shall be based on input received from the California Department of Fish and Wildlife (CDFW) and may vary depending on species and sensitivity to disturbance. The no-disturbance zone shall be fenced with temporary orange construction fencing or other conspicuous demarcation such as signage and flagging if construction is to be initiated on the remainder of the development site. ▪ A report of findings shall be prepared by the qualified biologist and submitted to the City of Belvedere for review and approval prior to initiation of construction within the no-disturbance zone during the nesting season (February through August). The report shall either confirm absence of any active nests or confirm that any young birds have fledged within a designated no-disturbance zone and construction can proceed. The combination of the above measures would reduce this potential impact to less than significant	
BIO-3: Proposed construction would require modifications within regulated waters.	PS	BIO-3: A compensatory mitigation program shall be developed and implemented to provide adequate mitigation for jurisdictional waters affected by proposed improvements. A jurisdictional wetland delineation shall be prepared by a qualified wetland specialist and submitted for verification by the U.S. Army Corps of Engineers (Corps). A Regulated Waters Protection and Replacement Program (RWPRP) shall be prepared by the qualified wetland specialist and implemented to provide compensatory mitigation where jurisdictional waters are affected, shall minimize disturbance to unvegetated waters, and shall be reviewed and approved by regulatory agencies. The RWPRP shall contain the following components: ▪ The RWPRP shall include appropriate implementation measures to prevent inadvertent loss and degradation of jurisdictional waters to be protected and shall provide for replacement of the estimated 1,200 square feet (0.03 acre) of regulated waters eliminated by sheet pile construction at a minimum 1:1 replacement ratio. ▪ Where verified waters of the U.S. are present and cannot be avoided, authorization for modifications to these features shall be obtained from regulatory agencies with jurisdiction. These agencies include the Corps under Section 404 permitting process	LTS

PS = Potentially Significant; LTS = Less Than Significant; SU = Significant and Unavoidable

TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		where waters of the United States are affected by the project and the Regional Water Quality Control Board (RWQCB) as part of the Section 401 Certification process. All conditions required as part of the authorizations by the Corps and RWQCB shall be implemented as part of the project. ▪ Consultation or incidental take permits may be required under the California Endangered Species Act and Federal Endangered Species Act. The City of Belvedere shall obtain all legally required permits or other authorizations from the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and California Department of Fish and Wildlife (CDFW) under the Endangered Species Acts. ▪ Temporary fencing or another system shall be installed to demarcate the limits of proposed construction in jurisdictional waters. The turbidity curtain may serve as the temporary construction containment fencing. ▪ Grading, construction, and restoration work within the jurisdictional waters shall be conducted in a way that avoids or minimizes disturbance of existing aquatic habitat as called for in Mitigation Measure BIO-1a. The combination of the above measures would reduce this potential impact to less than significant.	
Cultural Resources			
CULT-1: The project would cause a substantial adverse change in the significance of a historical resource pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15064.5.	PS	CULT-1a: To minimize architectural and structural damage to the China Cabin, no more than a peak particle velocity (PPV) of 0.25 inches per second (in/sec) is recommended at the structure. Furthermore, if a 0.25 PPV level or lower is maintained, project construction activities would not affect character-defining features, the structural integrity, and interior architectural features, resulting in no impact on the integrity or significance of the China Cabin building, meaning the proposed project would have a less-than-significant impact on this historical resource as defined by CEQA. The following measures to minimize architectural and structural damage to the China Cabin building from construction-related ground vibrations shall be implemented: 1. *A preconstruction survey and structural integrity inspection shall be conducted at the potentially affected historic buildings. The preconstruction survey shall include descriptions and photographs of both the exterior and interior of the buildings that could potentially be damaged during construction, including documentation of existing damage such as cracks and loose or damaged features.* 2. *Vibration levels at the China Cabin shall be monitored during construction activities with appropriate equipment such as a seismograph (monitor) and geophone (sensor).* 3. *Construction vibration specifications shall be included as part of the construction contract documents (e.g., "The contractor shall not exceed the construction vibration criterion of 0.25 in/sec PPV, at the historic structures, within the established critical*	LTS

PS = Potentially Significant; LTS = Less Than Significant; SU = Significant and Unavoidable

TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		distance for each construction activity. If at any time the ground vibration level exceeds the specified criterion of 0.25 in/sec PPV due to any construction activity, then the construction operation shall stop. Construction shall not recommence until the source of vibration is determined and replaced by an alternative construction technique or equipment.") 4. *In the event the project exceeds the construction vibration criterion of 0.25 in/sec PPV, a historic architect or qualified historic preservation professional shall inspect the China Cabin and proceed as follows:* ▪ If no damage has occurred to the China Cabin, the historic architect or qualified historic preservation professional shall submit a monthly report to the City of Belvedere for review. This report shall identify and summarize the vibration level exceedances and describe the actions taken to reduce vibration. ▪ If no damage has occurred to the China Cabin, the historic architect or qualified historic preservation professional shall submit a monthly report to the City of Belvedere for review. This report shall identify and summarize the vibration level exceedances and describe the actions taken to reduce vibration. ▪ If vibration has damaged the China Cabin, the historic architect or qualified historic preservation professional shall immediately notify the City and prepare a damage report documenting the features of the China Cabin that has been damaged. ▪ Should damage occur to the China Cabin due to construction-related vibration, the China Cabin shall be restored to its pre-construction condition in consultation with the historic architect or qualified historic preservation professional and the City. ▪ *After construction is complete, the City shall receive a final report from the historic architect or qualified historic preservation professional. The report shall include, at minimum, collected monitoring records, building condition summaries, descriptions of all instances of vibration level exceedance, identification of damage incurred due to vibration, and corrective actions taken to restore* the China Cabin to its pre-construction condition.	
		CULT-1b: The City of Belvedere shall retain a qualified professional archaeologist to monitor ground-disturbing activities. The archaeologist shall meet the Secretary of the Interior's professional qualifications standards for archaeology. The archaeologist shall have the authority to stop grading or construction work within 50 feet of any discovery of potential historical or archaeological resources in order to implement the procedures in Mitigation Measure CULT-3 and make a finding of significance under Section 15064.5 of the California Environmental Quality Act (CEQA) Guidelines.	
		CULT-1c: If subsurface deposits believed to be cultural or human in origin are discovered during construction by the monitor, all work must halt within a 50-foot radius of the discovery. A qualified professional archaeologist, who will evaluate the significance of the	

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TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		find, shall have the authority to modify the no-work radius as appropriate, using professional judgment. The following notifications shall apply, depending on the nature of the find: ▪ If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately, and no agency notifications are required. ▪ If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, they shall immediately notify the City of Belvedere and the United States Army Corps of Engineers (Corps), which shall consult on a finding of eligibility. If the find is determined to be a historical resource under the California Environmental Quality Act (CEQA) or a historic property under National Historic Preservation Act Section 106, then, appropriate treatment measures would be implemented. Work may not resume within the no-work radius until the City of Belvedere and the Corps, through consultation as appropriate, determine either that (1) the site is not a historical resource under CEQA or a historic property under Section 106, or (2) the treatment measures have been completed to their satisfaction. The preferred treatment would be avoidance and preservation in place. ▪ If the find includes human remains, or remains that are potentially human, Mitigation Measure CULT-3 shall apply. *With the incorporation of Mitigation Measure CULT-1a, CULT-1b, and CULT-1c, the impacts on the China Cabin and the archaeological historical resource would be less than significant.*	
CULT-2: The project could cause significant adverse changes in the significance of an archaeological resource pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15064.5.	PS	CULT-2: With the implementation of Mitigation Measures CULT-1b and CULT-1c, the impact on known and unknown archaeological resources would be less than significant.	LTS
CULT-3: The project could disturb human remains, including those interred outside of dedicated cemeteries.	PS	CULT-3: If human remains, or remains that are potentially human, are encountered, the City of Belvedere shall ensure reasonable protection measures are taken to protect the discovery from disturbance (in accordance with Assembly Bill [AB] 2641). The qualified professional archaeologist retained by the City (see Mitigation Measure CULT-1b) shall notify the Marin County Coroner (per Section 7050.5 of the California Health and Safety Code). The provisions of Section 7050.5 of the California Health and Safety Code, Section 5097.98 of the California Public Resources Code (PRC), and AB 2641 shall be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, the Coroner shall notify the Native American Heritage Commission (NAHC), which then would designate a Native American Most Likely Descendant (MLD) for the project (Section 5097.98 of the PRC). The designated MLD would have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, the	LTS

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TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		NAHC can mediate (Section 5097.94 of the PRC). If no agreement is reached, the landowner must rebury the remains where they would not be further disturbed (Section 5097.98 of the PRC). This shall also include either recording the site with the NAHC or the appropriate California Historical Resources Information System Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work may not resume within the no-work radius until the City of Belvedere, through consultation with the MLD as appropriate, determines that the treatment measures have been completed to its satisfaction. Implementation of Mitigation Measure CULT-3 would reduce impacts on human remains and dedicated cemeteries to less than significant.	
Energy			
The project would have no potentially significant energy impacts.			
Geology/Soils			
GEO-1: The project could result in potential substantial adverse effects on existing critical utilities due to seismic-related ground failure including liquefaction, lateral spreading, and landslides.	PS	GEO-1: City of Belvedere staff shall work with utility agencies to find an effective means to install flexible utility connections on utilities that have non-flexible pipes (including water, wastewater, and gas lines) that are located near the eastern and western ends of the proposed sheet piles along Beach Road and new utility laterals that would cross the proposed sheet piles along Beach Road to ensure that utilities would be capable of withstanding expected ground movements during seismic events and future settlement. The City shall retain a qualified geotechnical engineer to assist in the design of the improved utility connections. The installation of the new flexible connections shall occur prior to the conclusion of construction.	LTS
GEO-2: The project could result in potential impacts on existing utilities and other improvements due to vibration-induced settlement of unstable soil during sheet pile installation.	PS	GEO-2: A geotechnical report shall be prepared by a qualified geotechnical engineer and shall evaluate the potential for vibration-induced settlement from proposed sheet pile installation and the potential for damage to existing improvements (e.g., structures, utilities, fences, walls, guardrails, walkways, and patios) from vibration-induced settlement. If the geotechnical report identifies existing improvements that could potentially be damaged by vibration-induced settlement, a preconstruction survey of the potentially affected improvements shall be performed, allowable settlement amounts shall be estimated for the potentially affected improvements, and the allowable settlement amounts shall account for estimated future settlement amounts that are expected to occur due to the construction of the existing levees and placement of fill materials that previously occurred in the project area. Settlement monitoring shall be performed during construction activities. If the geotechnical report identifies any existing improvements that are very likely	LTS

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TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		to experience damage due to vibration-induced settlement, measures shall be implemented to prevent such damage prior to the start of sheet pile installation near the existing improvements. Such measures may include relocation of utilities, installation of flexible connections on utilities, temporary shoring/bracing of the existing improvements, or use of alternative methods for sheet pile installation near the existing improvements, such as use of a silent pile driver. If settlement monitoring indicates that construction activities have caused unacceptable levels of settlement or observable damage to existing improvements, or that construction activities would be expected to cause unacceptable levels of settlement if construction activities continue using the same methods, the vibration-causing activities shall cease and measures shall be implemented to prevent further settlement or damage to existing improvements. Such measures may include relocation of utilities, installation of flexible connections on utilities, temporary shoring/bracing of existing improvements, or use of alternative methods for sheet pile installation such as use of a silent pile driver. If any damage is caused to existing improvements as a result of vibration-induced settlement during sheet pile installation, the City of Belvedere shall repair the damage following the completion of project construction activities near the area of damage.	
GEO-3: Past, present, and reasonably foreseeable future projects, which include placement of loads over a geologic unit that is unstable and could result in settlement, could combine with the project to cause a cumulative adverse effect on existing Improvements.	PS	GEO-3: Implement Mitigation Measures GEO-1 and GEO-2. Implementation of these measures would reduce the project's contribution to the cumulative impact to less than significant.	LTS
Greenhouse Gas Emissions			
The project would have no potentially significant greenhouse gas emissions impacts.			
Hazards and Hazardous Materials			
HAZ-1: Use of Belvedere Way for construction staging could physically interfere with the use of Belvedere Way as a pedestrian evacuation route in an emergency.	PS	HAZ-1: The use of Belvedere Way for construction staging shall not include the storage of combustible or flammable materials on Belvedere Way. The use of Belvedere Way for construction staging may include the posting of signs indicating that the area is restricted from public access except for emergency evacuation purposes; however, the use of Belvedere Way for construction staging shall not physically restrict public access to Belvedere Way and shall allow for the safe passage of pedestrians along Belvedere Way at all times. The proposed construction staging uses of Belvedere Way shall be outlined in a Construction Staging Plan to be prepared by the project contractor and submitted to the City of Belvedere and the Tiburon Fire Protection District for review and approval to ensure that construction staging activities would not interfere with the use of Belvedere Way as a	LTS

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TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		pedestrian evacuation route. The Construction Staging Plan shall designate the materials and equipment that would be stored along Belvedere Way and the areas where they would be stored and shall describe the safety measures (e.g., placement of barricades, cones, and caution tape) to ensure that the storage of materials and equipment would not pose a safety hazard to pedestrians using Belvedere Way.	
Hydrology and Water Quality			
HYDRO-1: During construction, the proposed project could result in degradation of water quality in the Belvedere Lagoon and San Francisco Bay.	PS	HYDRO-1a: The following measures shall be implemented to reduce the risk of disturbed soils and spills/releases from affecting water quality in nearby surface waters during construction activities near or below the waterline of San Francisco Bay and the Belvedere Lagoon: ▪ The contractor(s) shall avoid sheet piling installation in the Bay along the exterior side of the Beach Road levee during tidal periods when the tidal water level is at 2.5 feet mean lower low water (MLLW) or higher. ▪ The contractor(s) shall install a turbidity curtain in the Bay to hydraulically isolate the narrow, approximately 400-foot-long strip of the bay where sheet pile installation occurs from the rest of the Bay. The turbidity curtain shall remain in place for the duration of installation activities and thereafter until such time that any increased turbidity has settled out and concrete has fully cured. ▪ The contractor(s) shall install a turbidity curtain in the lagoon to hydraulically isolate the portion of the lagoon where sheet pile installation occurs from the rest of the lagoon. The turbidity curtain shall remain in place for the duration of installation activities and thereafter until such time that any increased turbidity has settled out. ▪ The contractor(s) shall coordinate with the City of Belvedere Public Works Department and the Belvedere Lagoon Property Owners Association (BLPOA) to ensure that the lagoon is drawn down to the winter operating level prior to and for the duration of sheet pile installation activities in the lagoon and BLPOA's culverts and other water control facilities along San Rafael Avenue are shut off from the Bay for the duration of sheet piling installation and thereafter while the turbidity curtain remains installed.	LTS
		HYDRO-1b: The following measures shall be implemented to reduce the risk of spills, releases, and disturbed soils affecting water quality in nearby surface waters during construction activities: ▪ The contractor(s) shall designate storage areas suitable for material delivery, storage, and waste collection for disposal. Waste shall be disposed of off-site in a manner that complies with applicable regulations for waste disposal. These locations shall be as far away from catch basins, gutters, drainage courses, and water bodies as possible. All hazardous materials and wastes used or generated during project site development activities shall be labeled and stored in accordance with applicable local, state, and	

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TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		federal regulations. In addition, an accurate up-to-date inventory, including Material Safety Data Sheets (MSDSs), shall be maintained on-site to assist emergency response personnel in the event of a hazardous materials incident. ▪ All maintenance and fueling of construction vehicles and equipment shall be performed in a designated bermed area, or over a drip pan that would not allow runoff of spills. Vehicles and equipment shall be regularly checked and have leaks repaired promptly at an off-site location. Secondary containment shall be used to catch leaks or spills any time vehicle or equipment fluids are dispensed, changed, or poured. ▪ The contractor shall implement a Storm Water Pollution Prevention Plan (SWPPP) prepared by a Qualified SWPPP Developer (QSD) and designed to reduce potential adverse impacts on surface water quality during the construction period. The SWPPP shall include the minimum BMPs required for the identified risk level. BMP implementation shall be consistent with the BMP requirements in the most recent version of the California Stormwater Quality Association Stormwater Best Management Handbook-Construction. The SWPPP shall be designed to address the following objectives: 1) All pollutants and their sources, including sources of sediment associated with construction activity, are controlled. 2) Where not otherwise required to be under a Regional Water Quality Control Board (RWQCB) permit, all non-stormwater discharges are identified and either eliminated, controlled, or treated. 3) Site BMPs are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from construction activity. 4) Stabilization BMPs installed to reduce or eliminate pollutants and erosion of exposed soil after construction are completed. Stabilization BMPs, may include but would not be limited to: hydroseeding, planting of vegetation, installation of jute/burlap netting, and installation of swales in graded areas. 5) BMPs shall be designed to mitigate construction-related pollutants and at a minimum, include the following: a. Practices to minimize the contact of construction materials, equipment, and maintenance supplies (e.g., fuels, lubricants, paints, solvents, and adhesives) with stormwater shall be included. The SWPPP shall specify properly designed centralized storage areas that keep these materials out of the rain. b. Practices to reduce erosion of exposed soil, which may include but are not limited to soil stabilization controls, watering for dust control, perimeter silt fences, placement of hay bales, and sediment basins, shall be included.	

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TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		c. If grading or other ground-disturbing activities must be conducted during the rainy season, the primary BMPs selected shall focus on erosion control (i.e., keeping sediment on the site). End-of-pipe sediment control measures (e.g., basins and traps) shall be used only as secondary measures. Ingress and egress from the construction site shall be carefully controlled to minimize off-site tracking of sediment. Vehicle and equipment wash-down facilities shall be designed to be accessible and functional during both dry and wet conditions. 6) The SWPPP shall specify a monitoring program to be implemented by the construction site supervisor and shall include both dry and wet weather inspections. Monitoring shall be required during the construction period for pollutants that may be present in the runoff that are "not visually detectable in the runoff." ▪ Site supervisors shall conduct regular tailgate meetings to discuss pollution prevention. The frequency of the meetings and required personnel attendancelist shall be specified in the SWPPP. ▪ A Qualified SWPPP Practitioner (QSP), hired by the contractor, shall be responsible for overseeing implementation of BMPs at the site. The QSP shall be a qualified professional that has the required professional credentials and has passed specific training courses in accordance with the Construction General Permit. The QSP shall also be responsible for performing all required monitoring, and BMP inspection, maintenance, and repair activities. The QSP shall retain an independent monitor to conduct weekly inspections and provide written weekly reports to the City of Belvedere Public Works Department and/or the project team to ensure compliance with the SWPPP.	
		HYDRO-1c: Contractor(s) shall obtain applicable resource agency permits and approvals and comply with permit requirements to prevent impacts on water quality and demonstrate that water quality standards and/or waste discharge requirements are not violated. Permit requirements and avoidance measures that may be required by the U.S. Army Corps of Engineers and/or the San Francisco Bay Regional Water Quality Control Board (RWQCB) may include but not be limited to the following: ▪ Installation of physical barriers (e.g., silt curtains, turbidity curtains) to prevent potential localized impacts on water quality (e.g., increase in turbidity) from spreading to surrounding surface waters; ▪ Installation of physical barriers or use of tanks to contain wastewater generated during construction and prevent potential localized impacts to water quality of surrounding surface waters; and ▪ Performance of water quality monitoring, including sampling and analysis for turbidity and total suspended solids.	

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TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		At the direction of the applicable resource agency, the results of the water quality monitoring shall be compared to established performance standards. If water quality monitoring indicates that performance standards are not being achieved, additional avoidance measures (e.g., installation of additional silt curtains) shall be implemented until water quality monitoring indicates that performance standards are being achieved, which would mitigate the potential impacts on water quality to a less-than-significant level. Compliance with the Construction General Permit and implementation of Mitigation Measures HYDRO-1a, HYDRO-1b, and HYDRO-1c would ensure that potential impacts on water quality would be less than significant.	
Land Use and Planning			
The project would have no potentially significant land use and planning impacts.			
Noise			
NOISE-1: During project construction, use of construction equipment would generate a substantial temporary increase in ambient noise levels in the project vicinity in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	PS	NOISE-1: Noise reduction measures shall be implemented to reduce noise impacts related to project construction. Noise reduction measures shall include but are not limited to the following: ▪ The contractor shall implement a site-specific noise reduction plan prepared by a qualified acoustical consultant to reduce construction noise impacts to the maximum extent feasible, subject to review and approval by the City of Belvedere. The plan shall identify site-specific pile driving noise reduction measures that must be implemented prior to and during all construction activities to ensure noise levels would not exceed the 90 dBA L_{eq} threshold at nearby residences. ▪ Temporary noise barriers shall be placed between the proposed construction activities and nearby receptors when feasible. A sound blanket system hung on scaffolding, or other noise reduction materials that result in an equivalent or greater noise reduction than plywood, may also be used. The composition, location, height, and width of the barriers during different phases of construction shall be determined by a qualified acoustical consultant and incorporated into the site-specific noise reduction plan for the project. ▪ Avoid impact pile-driving where feasible in noise-sensitive areas. Pre-drilling or the use of a vibratory pile driver or silent pile driver are quieter alternatives where the geological conditions permit their use. ▪ Noise-generating construction and demolition activities, including material and equipment deliveries, shall be limited to between the hours of 8:00 AM and 5:00 PM	LTS

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TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		Monday through Friday. Occasionally, Saturday construction could occur with prior approval from the City. ▪ All construction equipment powered by internal combustion engines shall be properly muffled. ▪ Unnecessary idling of combustion engines shall be prohibited. Haul trucks shall not be allowed to idle for periods greater than 5 minutes, except as needed to perform a specified function such as concrete mixing. ▪ All stationary noise-generating construction equipment shall be located as far as practical from existing nearby residences and other noise-sensitive land uses. Such equipment shall also be acoustically shielded. ▪ Quiet construction equipment and technologies shall be selected whenever feasible. Motorized equipment shall be fitted with proper mufflers in good working order. ▪ Businesses and residents adjacent to the project site shall be notified in writing in advance of the proposed construction schedule before construction activities commence. ▪ The project contractor shall designate a "noise disturbance coordinator" responsible for responding to any local complaints about construction noise. The disturbance coordinator shall determine the cause of any noise complaint (e.g., starting too early, bad muffler, etc.) and shall require that reasonable measures be implemented to correct the problem (potentially including erection of a temporary noise barrier/wall). A telephone number for the disturbance coordinator shall be posted at the construction site. ▪ All of the above measures shall be required to be included in contract specifications. Implementation of Mitigation Measure NOISE-1 would reduce this impact to less than significant.	
NOISE-2: Construction of the proposed project could generate excessive groundborne vibration.	PS	NOISE-2: The following measures shall be implemented to reduce vibration impacts related to project construction: ▪ Pre-Construction Survey. Prior to the start of any vibration-generating construction activity, the City of Belvedere shall engage a consultant to undertake a pre-construction survey of potentially affected buildings within 45 feet of the proposed sheet pile alignment, provided that the property owner approves of the survey. All pre-construction surveys of potentially affected buildings and/or structures shall be prepared by a structural engineer or other professional with similar qualifications. The pre-construction surveys shall include descriptions and photographs of both the exterior and interior of the buildings that could potentially be damaged during construction, including documentation of existing damage such as cracks and loose or damaged	LTS

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TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		features. The pre-construction surveys shall be submitted to the City for review and approval prior to the start of vibration-generating construction activity. ▪ Avoid Impact Pile Driving Where Feasible. The use of impact pile driving equipment shall be limited to situations where the target depth cannot be reached using other pile driving equipment. The use of impact pile driving shall be prohibited within 45 feet of residential/commercial buildings to avoid potential vibration damage. When necessary, alternative methods, such as pre-drilling or excavation of soil to depths of up to approximately 10 feet, shall be performed prior to sheet pile installation to remove potential obstructions (e.g., large rocks) in the fill material of the levees to ensure that vibratory or silent pile driving methods will reach the target depth. ▪ Limited Use of Vibratory Pile Driving. The use of vibratory pile driving shall be prohibited within 16 feet of residential/commercial buildings to avoid potential vibration damage. When necessary, alternative methods, such as a silent pile driver, shall be used to ensure that construction vibration levels do not exceed the established standard. The silent pile driving method requires the use of vibratory pile driving to install the first few piles of a continuous sheet pile segment; therefore, the use of the vibratory pile driving to install the first few piles shall be performed in areas that are as far away as possible from the potentially affected buildings and/or structures. ▪ Limited Use of Vibratory Roller. The use of a vibratory roller shall be prohibited within 19 feet of residential/commercial buildings to avoid potential vibration damage. When necessary, alternative methods, such non-vibratory rollers or plate compactors, shall be used to ensure that construction vibration levels do not exceed the established standard. ▪ Vibration Management and Monitoring Plan. The contractor shall implement a monitoring plan prepared by a qualified engineer to avoid or reduce project-related construction vibration damage to adjacent buildings and/or structures and to ensure that any such damage is documented and repaired. The vibration management and monitoring plan shall apply to all potentially affected buildings and/or structures. The plan shall be submitted to the City for review and approval prior to the start of vibration-generating construction activity. The vibration management and monitoring plan shall include, but not be limited to, the following components: ◦ Maximum Vibration Level. The plan shall establish a maximum vibration level that shall not be exceeded at each building/structure on adjacent properties. The maximum vibration levels shall be based on existing conditions, character-defining features, soil conditions, and anticipated construction practices (common standards are a peak particle velocity [PPV] of 0.25 inch per second for historic buildings, 0.3 inch per second for older residential structures, and 0.5 inch per second for new residential structures and modern industrial/commercial buildings).	

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TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		◦ Buffer Distances. The plan shall identify the buffer distances to be maintained based on vibration levels and site constraints between the operation of vibration-generating construction equipment and the potentially affected building and/or structure, as presented in Table 4.11-9 of the Environmental Impact Report (EIR), to avoid damage to the extent possible. ◦ Vibration Monitoring and Reporting. The plan shall lay out the method and equipment for vibration monitoring and develop reporting protocol for City review. To ensure that construction vibration levels do not exceed the established standard, the contractor shall monitor vibration levels at each affected building and/or structure on adjacent properties and prohibit vibratory construction activities that generate vibration levels in excess of the standard. ◦ Alternative Construction Equipment and Techniques. The plan shall identify potential alternative equipment and techniques that could be implemented if construction vibration levels are observed in excess of the established threshold. Alternative construction equipment and techniques that can be used to reduce the vibration impact include, but are not limited to, the following: ▪ Pre-drilling or excavation of soil to depths of up to approximately 10 feet. ▪ Use of a static load piling system such as a silent pile driver. ▪ Avoidance of vibratory rollers and packers near sensitive areas. ▪ Use of smaller, lighter equipment. ◦ Repairing Damage. The plan shall identify provisions to be followed should damage to any building and/or structure occur due to construction-related vibration. The building(s) and/or structure(s) shall be remediated by the City to their pre-construction condition at the conclusion of vibration-generating activity on the project site, provided that the property owner approves of the repair. ▪ Halting of Construction. Should construction vibration levels be observed in excess of those established in the plan, the contractor(s) shall halt construction and implement alternative construction techniques identified in the plan. ▪ Inspections and Damage Notifications. Any inspections of buildings and/or structures for potential damage shall be performed by a qualified engineer. If vibration has damaged nearby buildings and/or structures, the qualified engineer shall immediately notify the City. ▪ Vibration Monitoring Results Report. After construction is complete, the City shall receive a final report from the professionally registered historic architect or qualified historic preservation professional (for effects on historic buildings and/or structures) and/or structural engineer (for effects on historic and non-historic buildings and/or structures). The report shall include, at minimum, collected monitoring records, building and/or structure condition summaries, descriptions of all instances of vibration level	

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Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		exceedance, identification of damage incurred due to vibration, and corrective actions taken to restore damaged buildings and structures. ▪ For potential impacts to the historic China Cabin, implement Mitigation Measure CULT-1a. Implementation of Mitigation Measure NOISE-2 would reduce the potential of construction-generated vibration to cause damage to adjacent buildings to a less-than-significant level.	
Public Services			
The project would have no potentially significant public services impacts.			
Recreation			
The project would have no potentially significant recreation impacts.			
Transportation/Traffic			
TRANS-1: Construction traffic would occur over an 8-month period and could conflict with Belvedere General Plan Policy TC-1.3, which states that "Traffic generated by construction activities, service vehicles, tourists, and special events should be minimized."	PS	TRANS-1a: The contractor shall produce a Traffic Control Plan (TCP) for construction activities that abides by the City of Belvedere's provisions regarding transportation and parking management during construction activities. The TCP shall be consistent with the latest edition of the California Manual on Uniform Traffic Control Devices (CA MUTCD). The TCP developed for the project shall coordinate construction activities in the area to maintain shuttle access to the off-site parking areas; maintain vehicle, pedestrian, and bicyclist access; and provide detours, as appropriate, for drivers, pedestrians and bicyclists.	LTS
		TRANS-1b: The TCP shall be prepared by the contractor and approved prior to the issuance of an encroachment permit by the Police Chief or City of Belvedere Public Works Manager.	
		TRANS-1c: The TCP shall, at a minimum, include the following provisions: ▪ Based on the daily volume of on-haul, the timing of trucks shall be adjusted to limit/minimize hauling activities during peak traffic hours. ▪ Whenever the contractor's operations affect normal conditions for traffic or for public access, the contractor shall furnish, erect, and maintain, at its expense, all fences, barricades, lights, signs, and other devices necessary to prevent collisions or damage or injury to the public. ▪ Construction area signs shall be furnished, installed, maintained, and removed when no longer required, in accordance with the provisions of Caltrans' Section 12 of the "State Specifications for Temporary Traffic Control" and any requirements of the special provisions.	

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TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		▪ The contractor shall furnish flaggers and guards necessary to give adequate warning to traffic and to the public of construction conditions. Flaggers and guards assigned to direct traffic or to warn the public of construction conditions shall perform their duties, and shall be provided with the necessary equipment, in accordance with the current edition of the Caltrans publication "Instructions to Flaggers." The equipment shall be furnished and kept clean and in good repair by the contractor. Signs, lights, flags, and other warning and safety devices shall conform to the requirements set forth in the current Caltrans "Manual of Traffic Controls for Construction and Maintenance Work Zones." ▪ No material or equipment shall be stored where it will interfere with the free and safe passage of public traffic, including in pedestrian walkways, and at the end of each day and at other times when construction operations are suspended for any reason, the contractor shall remove all equipment and other obstructions from that portion of the roadway open for use by public traffic. ▪ Construction activity shall not result in the closure of existing pedestrian sidewalks/ walkways, bicycle facilities, or public transit facilities. The contractor shall provide safe, clearly identifiable and separated pedestrian pathways, per the California Manual on Uniform Traffic Control Devices (CA MUTCD). Signs and barricades shall be required to direct pedestrians through or around the construction work zones and shall be shown on the TCP. More specifically, any sidewalk or walkway closure, or any other work that does not provide a continuous 4-foot-wide clear path of travel on the same side of the street, shall result in the identification of a marked detour route for pedestrians. Detours shall include pedestrian separation from moving vehicles by cones, k-rails, or another form of physical separation. The barriers must be provided and maintained at all times. Sidewalks and walkways shall not be closed in the middle of the block as this generally results in pedestrians having to walk around the work site, usually into the street, to continue down the sidewalk. The contractor shall be required to post and maintain the appropriate pedestrian signs, including "SIDEWALK CLOSED AHEAD / USE OTHER SIDE," "SIDEWALK CLOSED," "NO PEDESTRIAN CROSSING," and "USE CROSSWALK."	
		TRANS-1d: The contractor shall obtain authorization from Marin Transit and Golden Gate Transit if construction requires the temporary closure of any existing bus stops. If required by the transit agencies, the contractor shall establish temporary bus stops with appropriate passenger amenities during the construction period.	
		TRANS-1e: The contractor shall maintain all existing bicycle routes. During construction, temporary bike facilities may be delineated by cones, but the contractor shall maintain a clear and clean path of travel for bicyclists at all times. A bike route detour may be	

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TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		provided pending approval from the City. Signs such as "Bicyclists Allowed Full Use of Lane" or "Bicycle Route Detour" signs shall be posted. Implementation of Mitigation Measures TRANS-1a through TRANS-1e would ensure that the potential impact related to conflict with Belvedere General Plan Policy TC-1.3 would be less than significant.	
Tribal Cultural Resources			
TCR-1: The project could cause a substantial adverse change in the significance of a tribal cultural resource (TCR), defined in Public Resources Code (PRC) Section 21074.	PS	TCR-1a: One tribal monitor shall be retained to monitor all vegetation clearing and removal, surface grading, excavation, and trenching within the project site. The tribal monitor shall have the authority to temporarily pause ground disturbance within 50 feet of the discovery for a duration long enough to examine potential tribal cultural resources (TCRs) that may become unearthed during the activity. If no TCRs are identified, then construction activities may proceed, and no agency notifications are required. In the event that a TCR is identified, the monitor shall flag off the discovery location and notify the City of Belvedere immediately to implement Mitigation Measure TCR-1b. Work can continue in other areas of the project during implementation of Mitigation Measure TCR-1b, as long as it is monitored if required.	LTS
		TCR-1b: If any suspected tribal cultural resources (TCRs) are discovered during ground-disturbing construction activities, all work shall cease within 100 feet of the find, or an agreed-upon distance based on the project area and nature of the find. A Tribal Representative from a California Native American tribe that is traditionally and culturally affiliated with the geographic area shall be immediately notified and shall determine if the find is a TCR (see Public Resources Code [PRC] Section 21074). The Tribal Representative shall make recommendations for further evaluation and culturally appropriate treatment as necessary. If deemed necessary by the City of Belvedere, a qualified cultural resources specialist meeting the Secretary of Interior's Standards and Qualifications for Archeology may also assess the significance of the find in joint consultation with Native American Representatives to ensure that Tribal values are considered. Work at the discovery location may not resume until the City, in consultation as appropriate and in good faith, determines that all necessary investigation and treatment of the discovery under the requirements of the California Environmental Quality Act (CEQA), including Assembly Bill (AB) 52, have been satisfied.	
		TCR-1c: The City of Belvedere shall require the project contractor to provide a cultural resource and tribal cultural resource (TCR) sensitivity and awareness training program (Worker Environmental Awareness Program [WEAP]) for all personnel involved in project construction, including field consultants and construction workers. The WEAP shall be developed in coordination with an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for Archeology, as well as culturally affiliated Native	

PS = Potentially Significant; LTS = Less Than Significant; SU = Significant and Unavoidable

TABLE 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Without Mitigation	Mitigation Measure	Level of Significance After Mitigation
		American tribes. The City shall invite a Native American representative from interested culturally affiliated Native American tribes to participate. The WEAP shall be conducted before any project-related construction activities begin at the project site. The WEAP shall include relevant information regarding sensitive cultural resources and TCRs, including applicable regulations, protocols for avoidance, and consequences of violating state laws and regulations. The WEAP shall also describe appropriate avoidance and impact minimization measures for cultural resources and TCRs that could be located at the project site and shall outline what to do and whom to contact if any potential cultural resources or TCRs are encountered. The WEAP shall emphasize the requirement for confidentiality and culturally appropriate treatment of any discovery of significance to Native Americans and shall discuss appropriate behaviors and responsive actions, consistent with Native American tribal values. The combination of Mitigation Measures TCR-1a, TCR-1b, and TCR-1c would reduce this impact to less than significant.	
Utilities and Service Systems			
The project would have no potentially significant utilities and service systems impacts.			

PS = Potentially Significant; LTS = Less Than Significant; SU = Significant and Unavoidable

3. PROJECT DESCRIPTION

3.1 INTRODUCTION

This EIR evaluates the Belvedere Seismic Upgrade Project (BSUP or project), a City of Belvedere proposal to install sheet piling along specific segments of San Rafael Avenue and Beach Road in an area of existing levees. Soils beneath these two main roads consist primarily of intermixed sands and Bay mud layers produced from the dredging process that established the Belvedere Lagoon and levee embankments. These layers are prone to liquefaction during an earthquake. In the event of an earthquake, the proposed sheet piles would help stabilize and prevent deformation of the levees and resultant damage to buried utilities and allow evacuation routes and access to be maintained for emergency vehicles. Figure 3-1 shows the regional and local location of Belvedere and the project.

Originally and as addressed in the Notice of Preparation for this project (see Appendix A), the City considered combining the sheet piling work with new flood barriers in the same vicinity as a way to protect Belvedere from flooding during coastal storms as exacerbated by projected sea level rise. Since then, and in response to community concerns, the City decided to remove the flood barrier work from the currently proposed project. The sheet piling and the flood barrier work are two independent projects that can be evaluated separately in documents that conform to the California Environmental Quality Act (CEQA). If and when the flood barrier work (now known as the Flood Barrier Project) is proposed, a future CEQA document would be required for that activity.

Utilities present beneath San Rafael Avenue and Beach Road include wastewater pipelines (Sanitary District No. 5), water pipelines (Marin Municipal Water District), gas pipelines and electrical lines (Pacific Gas & Electric Company), and internet/phone lines (Comcast and AT&T) that are maintained by agencies separate from the City of Belvedere. San Rafael Avenue and Beach Road are two-lane local roads that provide access from Tiburon Boulevard to the Belvedere Lagoon area and Belvedere Island to the west. Seismic activity could not only put the road surface at risk but could also damage the utilities located beneath the roadway that serve multiple locations. A schematic showing underground utilities in relation to the proposed sheet piles is provided in Figure 3-2.

3.2 PROJECT LOCATION

The BSUP would take place in two key locations within the City of Belvedere. Belvedere is located in the southern portion of Marin County and bordered by San Francisco Bay on three sides—south, west, and northeast. The Town of Tiburon adjoins Belvedere to the east. A large lagoon bordered by single-family residences is located in the eastern, level portion of Belvedere. To the west, the original island of Belvedere rises in elevation and includes varied terrain at the Bay's edge, affording long-distance views in all directions.

The BSUP would take place in the northern portion of Belvedere, along San Rafael Avenue, and in the south-central portion along Beach Road (see Figure 3-3 and Figure 3-4). The project would be entirely in the location of existing levees and would have a footprint of approximately 1,000 linear

Figure 3-1

SOURCE: Stetson Engineers, 2022

REGIONAL AND PROJECT LOCATION

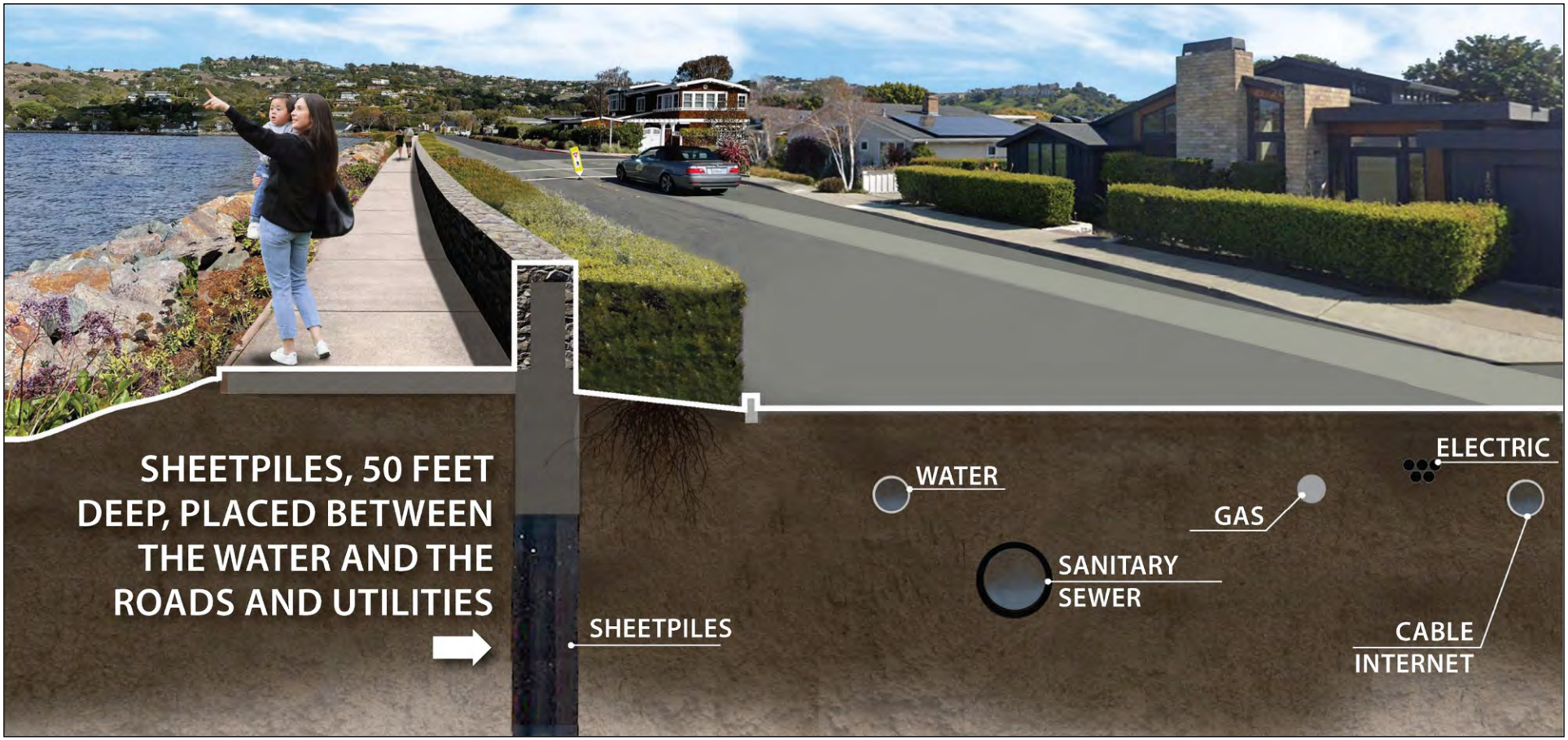


Figure 3-2

UNDERGROUND UTILITIES

SOURCE: City of Belvedere, 2022

Figure 3-3

SOURCE: Stetson Engineers, 2022

SAN RAFAEL AVENUE AND WEST SHORE ROAD PLAN VIEW

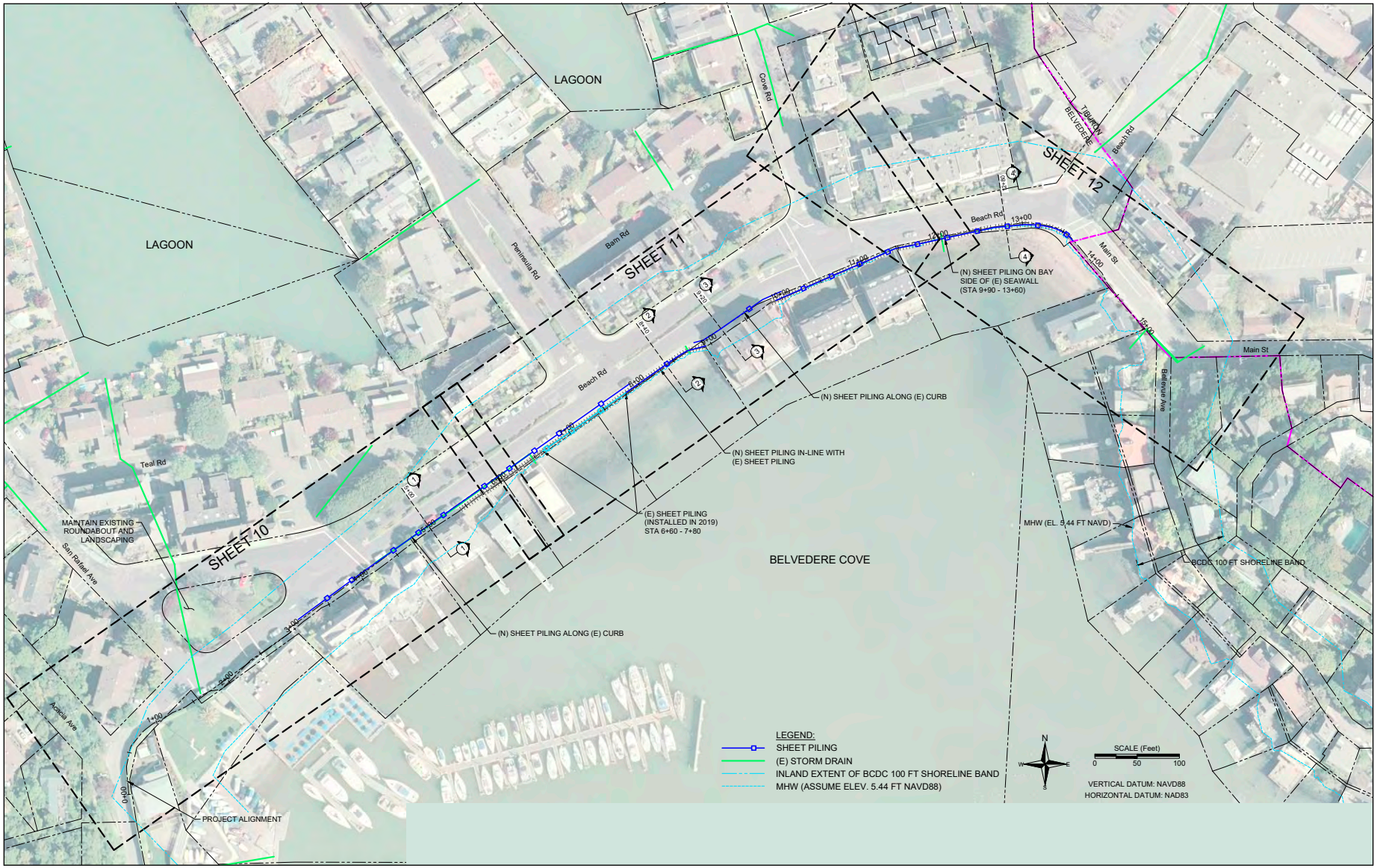


Figure 3-4

SOURCE: Stetson Engineers, 2022

BEACH ROAD PLAN VIEW

feet along San Rafael Avenue and 1,400 linear feet along Beach Road. The main access point for San Rafael Avenue and Beach Road is Tiburon Boulevard, which extends from U.S. Highway 101into the southern end of the Town of Tiburon. U.S. Highway 101 provides regional access to and from points north and south in Marin County and beyond.

The main areas of the proposed sheet piling are publicly accessible locations that currently provide pedestrian access along the Bay's edge. The trails in this area are not part of the San Francisco Bay Trail, which is located east and north of the project site adjacent to Tiburon Boulevard. However, levees and pathways along San Rafael Avenue are shown as Open Space in the City's General Plan (City of Belvedere, 2010), and along Beach Road some areas are shown as Open Space and other areas are shown as Recreation.

Land uses surrounding the project site include San Francisco Bay, which forms the northern edge of the San Rafael Avenue portion and the southern edge of the Beach Road portion. Residences and other public roads adjoin the opposite side of the San Rafael portion. Along Beach Road, single-family and multi-family residences are located to the north, and to the south, separating Beach Road from the Bay, are the Belvedere-Tiburon Landmarks China Cabin, the San Francisco Yacht Club, and residential properties, mostly owned by the Belvedere Land Company.

3.3 GENERAL PLAN DESIGNATIONS AND ZONING

The City's General Plan (City of Belvedere, 2010) designates areas adjoining the south side of San Rafael Avenue as Medium Density Single Family Residential (SFR) (3.1 to 6.0 units per net acre) (see Figure 3-5). This same designation applies to much of the area surrounding the Belvedere Lagoon, while the hillside residential area above and west of the project site is designated Low Density Single Family Residential (1.0 to 3.0 units per net acre). Along Beach Road, the south side includes General Plan designations of Medium Density Multi-Family Residential (5 to 20 units per net acre), Park/Public Facility, and Open Space. On the north side of Beach Road, designations are primarily Medium Density Multi-Family Residential (5 to 20 units per net acre). A small "island" of Park/Public Facility exists at the intersection of Beach Road and San Rafael Avenue.

Properties along the San Rafael Avenue portion of the project site are zoned Residential (R-1L) (see Figure 3-6). Along the Beach Road portion, properties are zoned Planned Unit Development (PUD), Recreation (R),Open Space (O), and Residential (R-3).

3.4 PROJECT BACKGROUND

The existing levees along San Rafael Avenue and Beach Road were improved as modern roads in the 1950s. These two main arterial roadways in Belvedere are the location of critical underground utilities (e.g., water, wastewater, gas, electricity, communications) and serve as main routes connecting developed residential areas of Belvedere to the Tiburon Peninsula.

Response to earthquake-related fires and other emergencies requires open, uninterrupted access along both San Rafael Avenue and Beach Road, but given unstable soil conditions, an earthquake could damage these two roads and result in blockage of emergency vehicle access.

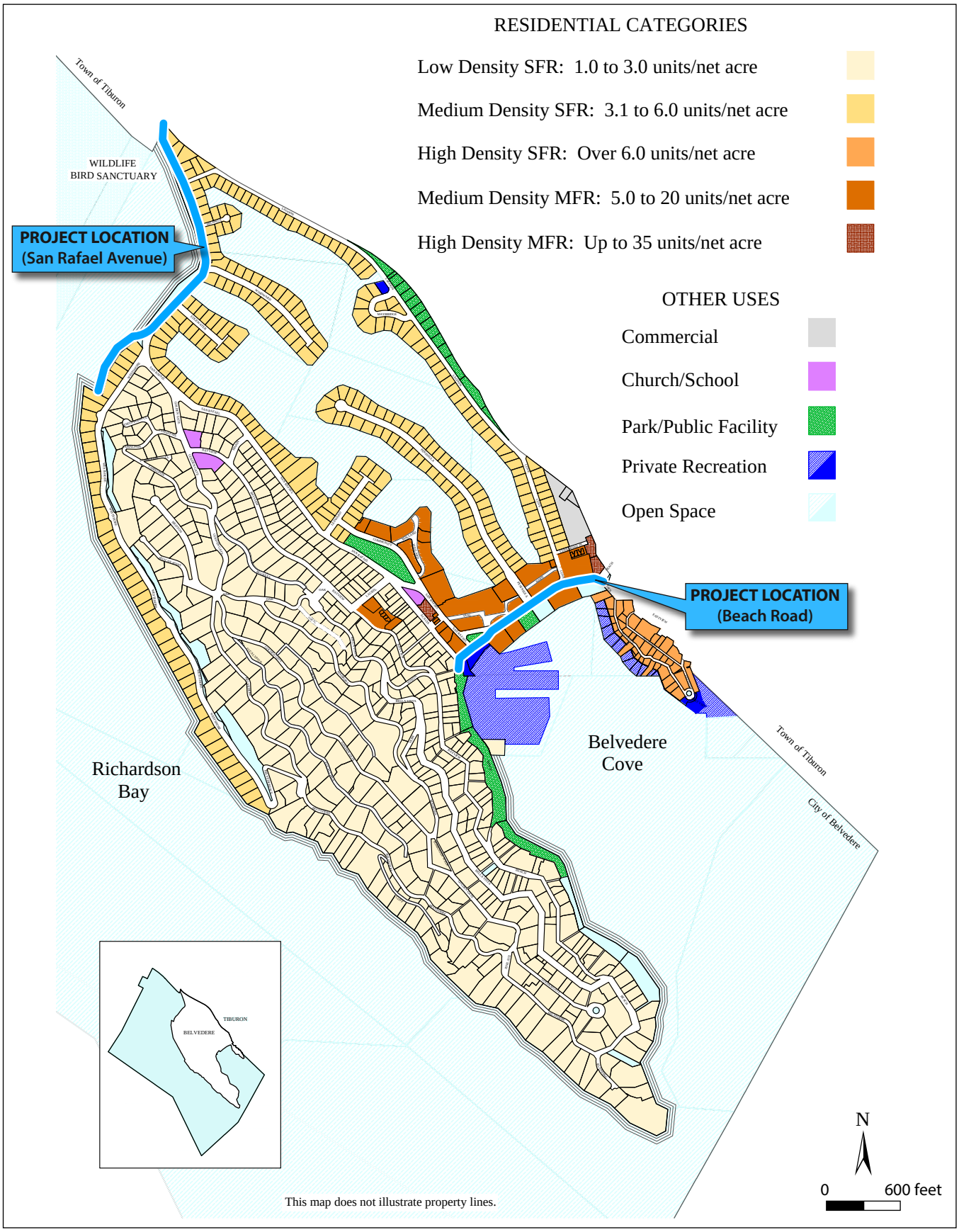


Figure 3-5

SOURCE: City of Belvedere, 2022

CITY OF BELVEDERE GENERAL PLAN

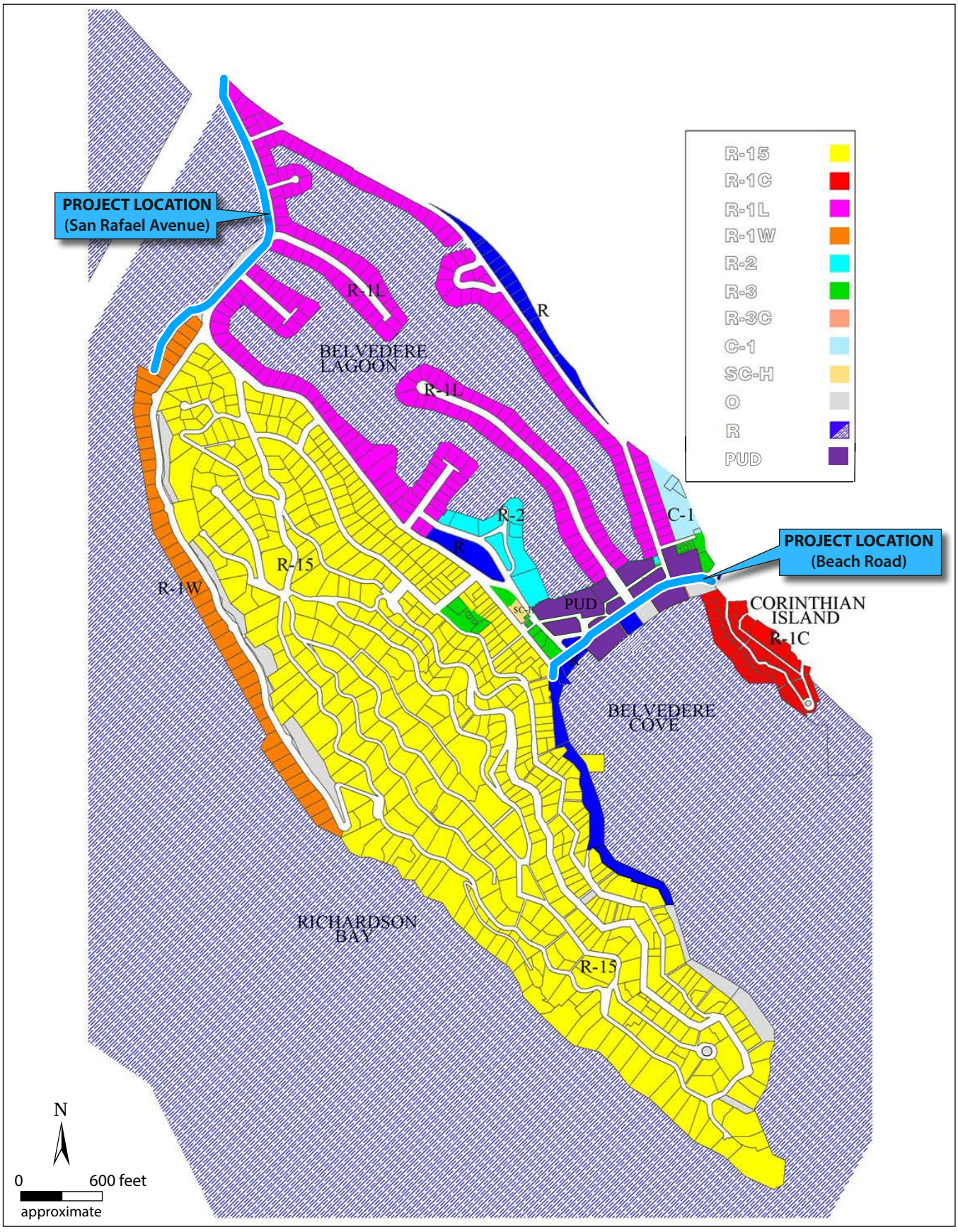


Figure 3-6

SOURCE: City of Belvedere, 2022

CITY OF BELVEDERE ZONING

Recent improvements to the levees include work on the Beach Road seawall in 2014 and 2019 to shore up the seawall's insufficient foundation. These were only interim repairs, however, and more work is needed. Soils beneath Beach Road and San Rafael Avenue are similar and consist primarily of intermixed sands and Bay mud layers produced from the dredging process that established the Belvedere Lagoon and levee embankments. These layers are prone to liquefaction during an earthquake. Sheet piles are intended to counter these deficiencies.

3.5 PROJECT OBJECTIVES

The City of Belvedere has the following objectives in proposing the BSUP:

- To reduce the risk of seismic impacts that could damage property, critical roads, utilities, and other infrastructure and put residents at risk.
- During construction, to minimize impacts on Belvedere residents while providing for the needed seismic upgrades.
- During construction, to minimize impacts on sensitive biological resources.
- During construction, to avoid direct impacts on fully tidal waters and wetlands to the maximum extent feasible.
- During construction, to minimize disruption to traffic flow, parking, and pedestrian access both during construction and at project completion.
- To design for long-term needs while making the project cost-effective for current residents.

3.6 SCOPING MEETING AND COMMENTS MADE

An online scoping meeting for the EIR was held on February 9, 2022. At this meeting, the City and consultants explained the project and the CEQA process. At that time, the project was to include the proposed sheet piles as well as flood barrier features, such as increasing the height of seawalls along the levees, to protect against coastal flooding. However, these flood barrier components are no longer part of the project being evaluated in this EIR. Public comments made at the scoping meeting that relate to the project as currently proposed focused on the following:

- Conflict of interest with the project engineer preparing the Hydrology section of the EIR;
- Concern about sheet piles and vibration impacts associated with sheet pile installation;
- Possible need for more sheet piles on San Rafael Avenue where instability may occur; and
- Need to define permitting timing.

3.7 PROPOSED PROJECT

The proposed project consists of sheet pile improvements to reduce deformation and the risk of damage to roads and utilities during seismic events. To provide the needed seismic stability improvements, steel sheet piles would be installed at depths of 40 to 50 feet along specific

segments of Beach Road[1] and San Rafael Avenue. The sheet piles would provide a vertical barrier between the Bay and the adjoining road and utilities, as shown in Figure 3-2. Sheet piles are interlocking steel panels, with each panel ranging from 1/4 to 1 inch in thickness. These sheet piles would reduce the lateral displacement of the levees during earthquakes and thereby reduce the risk of levee deformation and resultant damage to roads and utilities.

SHEET PILE LOCATIONS

Along San Rafael Avenue, sheet piles would be placed along about one half the total length of the levee, from the southern end of San Rafael Avenue at West Shore Road north to Windward Road. A short (145-foot) section of sheet piles would also be installed in the Belvedere Lagoon between Windward Road and Edgewater Road (see Figure 3-3 for map). The sheet piles in the lagoon would be driven to a depth of 40 feet. The top of the sheet piles would lie at or just below existing grade at the bottom of the lagoon to ensure they are below lagoon water level control facilities maintained by the Belvedere Lagoon Property Owners Association (BLPOA). The sheets would be installed in the water and the lagoon would be temporarily drawn down to the typical winter water level to minimize submergence during installation. There would be no excavation or backfill earthwork involved. This section of sheet piling would be located in the lagoon rather than higher on the sidewalk or San Rafael Avenue to avoid conflict with the BLPOA facilities (two large culverts and electrical controls for pumps) and other existing water, communication, and gas utilities.

Along Beach Road, sheet piles would be installed along nearly the full length from the San Rafael Avenue intersection to the Main Street intersection (see Figure 3-4). The proposed sheet pile installation along Beach Road would occur in front of seven buildings located along the bay side of Beach Road. These seven buildings are served with sewer, water, gas, electricity, and communication utility lines. Prior to installation of the sheet piles, services to these buildings would be interrupted for up to 4 to 8 hours to establish temporary service connections. Following installation of the sheet piles, permanent utility service connections to the buildings would be re-established either through or around the new sheet piles. While the permanent service connections are re-established, there may be a second period of service interruptions up to 4 to 8 hours. Additionally, a gas line, a communication line, and a City storm drain pipe located near and parallel to the sidewalk in front of the four bayside buildings next to the San Francisco Yacht Club (50 Beach Road, 58 Beach Road, 60-62 Beach Road, and 80-88 Beach Road) would have sheet piles installed in front of them. Sheet pile installations in front of those four buildings may require relocating a portion (up to a couple hundred feet) of the gas line, communication line, and City storm drain pipe that are near and parallel to the proposed sheet pile alignment (Fulwiler, 2022).

The following are the approximate lengths of new sheet pile along the two roads:

- San Rafael Avenue sheet piling: 800 feet
- Beach Road sheet piling: 1,100 feet

[1] The site of the improvements would be Lower Beach Road, which is the portion of Beach Road near its intersection with San Rafael Avenue.

PROJECT CONSTRUCTION

The types of construction equipment that would be used on the project site include an impact pile driver, vibratory pile driver, air compressors, compactors, excavators, dozers, loaders, pavers, rollers, concrete mixer trucks, flatbed trucks, and sweepers/scrubbers. Sheet piles would predominantly be driven using vibratory hammers, although impact hammers may need to be used in certain locations if the vibratory hammer is not sufficient to complete the installation. Cross-sections are shown in Figure 3-7 and Figure 3-8.

An estimated 31,200 square feet of steel sheets for San Rafael Avenue and 50,400 square feet of steel sheets for Beach Road would be brought to the site for project construction.

For erosion control and water quality protection, Best Management Practices (BMPs) would be implemented during all phases of construction. BMPs include use of turbidity curtains, silt fences, or straw wattles along the shoreline to control erosion and release of sediments into adjacent waters.

Staging Areas and Routes of Travel for Construction Vehicles

The locations of project limits of work, staging areas, and access routes are shown in Figure 3-9 and Figure 3-10. The steel sheet piles would be transported to the project site and temporarily stored in staging areas along San Rafael Avenue and Beach Road during installations.

Along San Rafael Avenue, existing rock material would be moved, temporarily stored (at either on-site or off-site staging areas) and replaced in its prior locations following construction and installation of the sheet piles. A Construction Management Plan can be found in Appendix C.

Emergency Access and Evacuation Routes During Construction

Construction would be staged such that emergency access to Belvedere Island would be maintained either via Beach Road or San Rafael Avenue. Generally, the construction along San Rafael Avenue would require closing one lane, with potential limited periodic closures of both lanes. Similarly, construction along Beach Road would require closing one lane of traffic, with potential limited periodic closures of both lanes. One lane would always remain available for emergency response and evacuation purposes. The portion closed for construction would be limited to the necessary distance on either end of the current construction work area to ensure the safety of drivers, pedestrians, and construction workers.

The City of Belvedere General Plan (Exhibit 12) (City of Belvedere, 2010) identifies San Rafael Avenue as Evacuation Route C and much of Beach Road as Evacuation Route A. Also, Beach Road and San Rafael Avenue are shown as two main arterials that feed into Tiburon Boulevard, which is the main access road serving the Tiburon-Belvedere Peninsula.

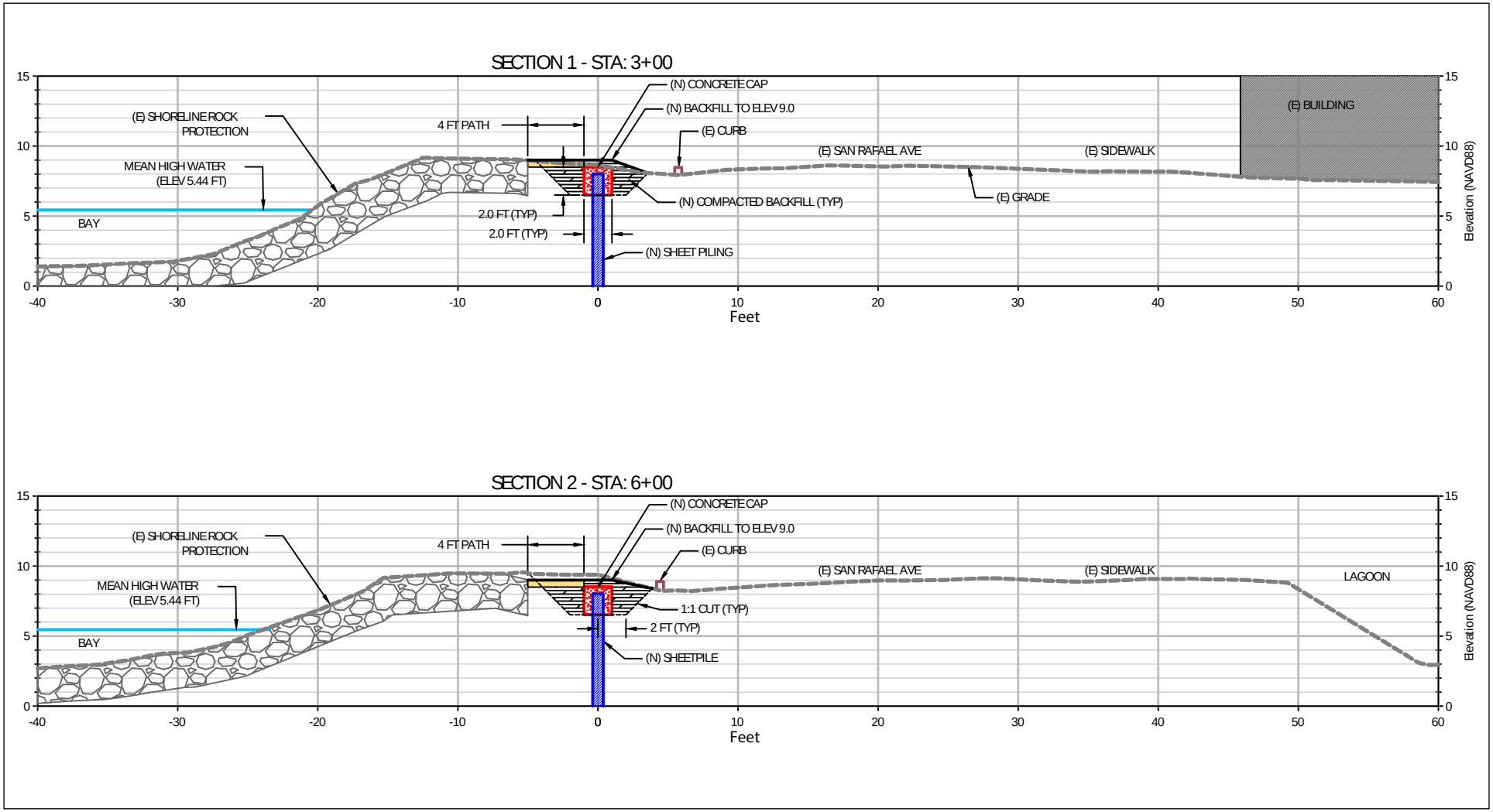


Figure 3-7

SOURCE: Stetson Engineers, 2022

SAN RAFAEL AVENUE TYPICAL CROSS SECTIONS

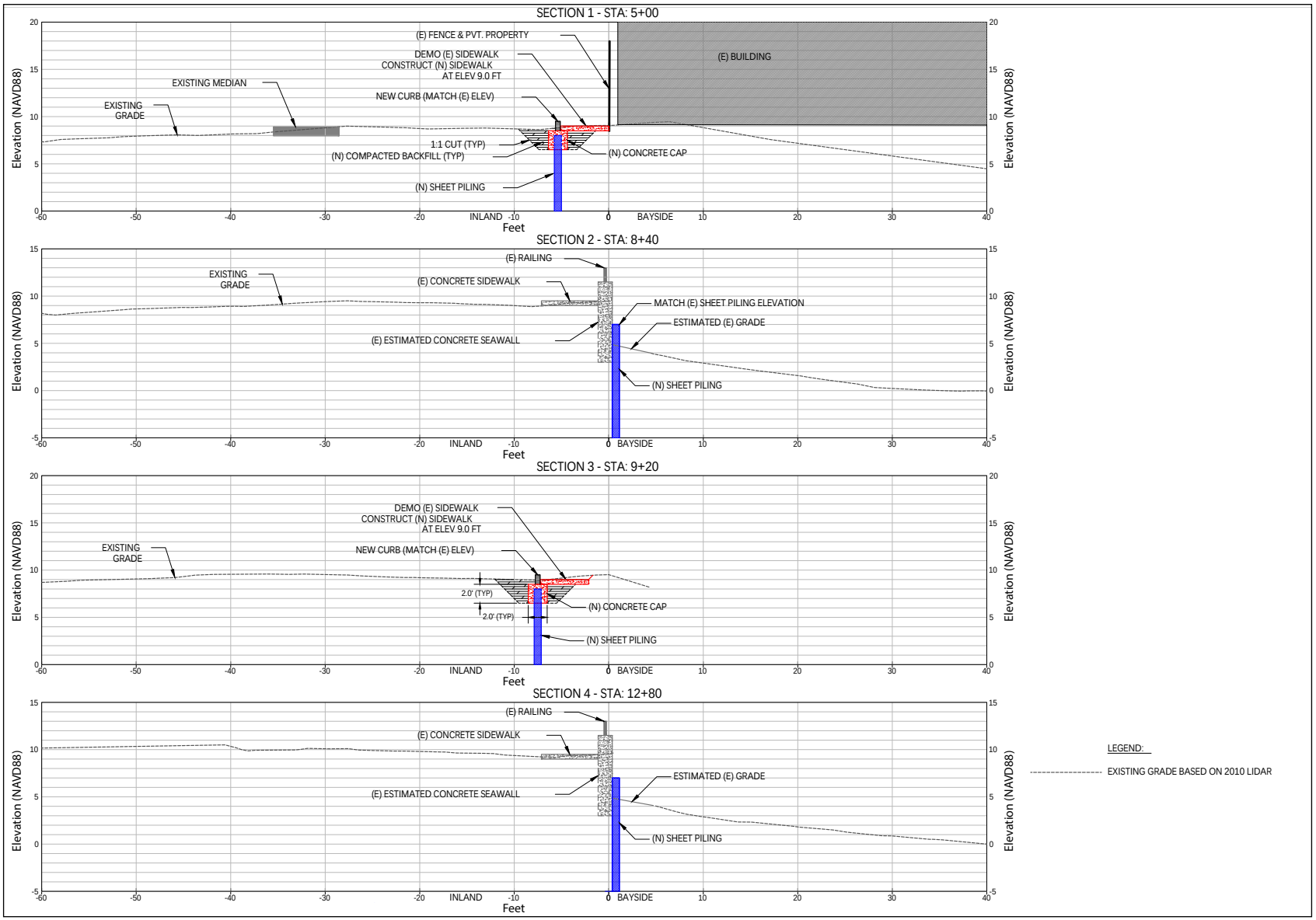


Figure 3-8

SOURCE: Stetson Engineers, 2022

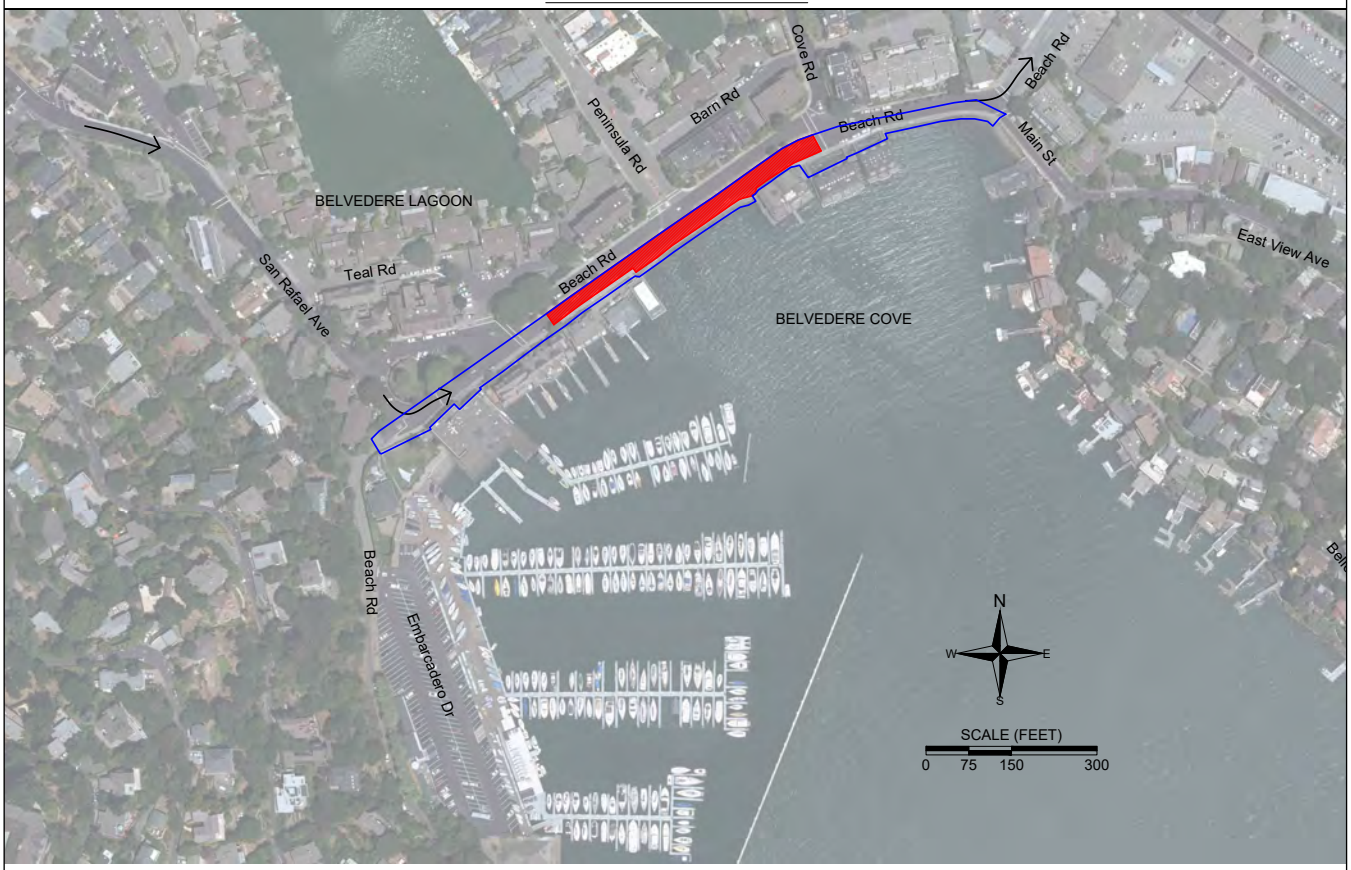
BEACH ROAD TYPICAL CROSS SECTIONS

Figure 3-9

SOURCE: Stetson Engineers, 2022

CONSTRUCTION PLAN

SAN RAFAEL AVE



BEACH ROAD

Figure 3-10

SOURCE: Stetson Engineers, 2022

STAGING AREAS FOR BEACH ROAD AND SAN RAFAEL AVENUE

Construction Duration

The overall construction duration is expected to be approximately 8 months. Construction would first take place along San Rafael Avenue and take approximately 3 to 4 months. Construction along Beach Road would only begin after substantial completion of San Rafael Avenue improvements and would take approximately 3 to 4 months to complete. It is anticipated that construction could begin as early as 2023, depending on available funding.

Construction Employment, Hours, and Parking

During the 8-month construction period, construction crews of approximately 5 to 15 employees would work 5 days per week. Construction would occur during the hours of 8:00 AM to 5:00 PM, Monday through Friday. Occasionally, Saturday construction could occur with prior approval from the City.

Contractor and sub-contractor employees would be required to park their personal vehicles outside the City of Belvedere and be transported to and from the construction area via contractor-supplied vans or buses. The contractor would determine the location of the employee parking area.

RECONSTRUCTION OF PEDESTRIAN IMPROVEMENTS AND LANDSCAPING

Following the sheet pile installation, the City would reconstruct any pedestrian sidewalks and pathways and landscaping that were damaged during installation.

ONGOING MAINTENANCE

Following construction, ongoing maintenance activities would include routine maintenance of restored sidewalks and pathways damaged during construction.

FUTURE IMPROVEMENTS BY UTILITY AGENCIES

In certain areas, City of Belvedere staff is recommending that utility agencies install flexible utility mainlines and couplings to make service lines more resilient in the event of earthquakes. Such utility couplings would be needed for water, wastewater, and gas lines. Generally, electric and communication (Comcast and AT&T) lines are already installed in flexible polyvinyl chloride (PVC) conduits and are more resilient against lateral shifts and movement.

These utility improvements are not currently part of the proposed project as utility lines are owned by others and, as such, these improvements should be completed by agencies other than the City of Belvedere. For example, water lines would need to be improved by Marin Municipal Water District (MMWD or Marin Water) and wastewater lines would need to be improved by Sanitary District No. 5. Pacific Gas and Electric Company (PG&E) would make improvements to gas lines. City staff is working with these agencies to determine if construction schedules can be aligned to limit construction related disruption.

3.8 REQUIRED REGULATORY APPROVALS

Each environmental topic section of the EIR addresses the project's required regulatory approvals related to that specific topic. A summary is provided below.

FEDERAL AGENCY APPROVALS

The project may require review and approval from the following federal agencies:

- United States Army Corps of Engineers: Clean Water Act Section 404 Permit (related to discharge into Waters of the U.S.); Section 10 of the Rivers and Harbors Act of 1899 (if any construction in navigable water of the U.S.)
- United States Fish and Wildlife Service: Section 7 of the Endangered Species Act (related to potential impacts on listed endangered or threatened species)
- National Marine Fisheries Service: Section 7(a)(2) of Endangered Species Act (related to species and Essential Fish Habitat)

STATE AGENCY APPROVALS

The project may require review and approval from the following State of California agencies:

- Office of Historic Preservation: Section 106 of the National Historic Preservation Act (NHPA)
- Native American Heritage Commission: Section 101(d)(6)(B) of NHPA
- San Francisco Regional Water Quality Control Board (representing State Water Quality Control Board): Section 401 Water Quality Certification and Porter-Cologne Waste Discharge Permit
- California Department of Fish and Wildlife Section 2081 Incidental Take Permit (related to potential impacts on listed endangered or threatened species)
- State Lands Commission: lease agreement

REGIONAL AND LOCAL AGENCY APPROVALS

- San Francisco Bay Conservation and Development Commission (BCDC): Development Permit for disturbance within BCDC's 100-foot shoreline band jurisdiction and Coastal Zone Management Act (CZMA) consistency determination
- City of Belvedere Planning Commission and City Council project review and approval; certification of EIR

3.9 REFERENCES

City of Belvedere, 2010. City of Belvedere General Plan 2030, Adopted June 9.

Fulwiler, Julian, Stetson Engineers, 2022. E-mail to Amy Skewes-Cox re. "Beach Rd Utility Interruptions," September 15, 2022.

4. ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

This chapter describes the environmental setting and addresses project-related impacts and mitigation measures within the following 16 topic categories:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology/Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Public Services
- Recreation
- Transportation/Traffic
- Tribal Cultural Resources
- Utilities and Service Systems

Each of the 16 topic sections in this Environmental Impact Report (EIR) presents information in five subsections, as follows:

- Introduction. This subsection addresses the overall issues covered for the topic and the approach used in the analysis.
- Environmental Setting. This subsection briefly describes elements of the project setting relevant to a discussion of impacts in the topic category.
- Regulatory Framework. This subsection describes federal, state, and local regulations applicable to the topic.
- Environmental Impacts and Mitigation Measures. This subsection identifies potential impacts based on the identified significance criteria. Potentially significant impacts are numbered and summarized in bolded text, followed by text that describes the impact in more detail. Mitigation measures (indented text) that can reduce such impacts follow this discussion; these measures are labeled with a number that corresponds to the number of the impact. A statement regarding the level of significance of each impact after mitigation follows the mitigation measure for that impact. The term “PS” stands for “potentially significant” and “LTS” stands for “less than significant.” The term “SU” stands for “significant and unavoidable.”
- References. This subsection lists reference materials used in preparing the analysis.

Other topics specified in Appendix G of the California Environmental Quality Act (CEQA) Guidelines are not addressed further in the Draft EIR, for the following reasons:

- Agriculture and Forestry Resources and Mineral Resources. The topics of agriculture and forestry resources and mineral resources would not apply, given the urbanized nature of the project site.
- Population and Housing. The topic of population and housing is not discussed because no housing would be displaced by the project, and growth-inducing impacts are addressed in Chapter 6, Other CEQA Considerations.
- Wildfire. The wildfire topic is not addressed in its own section of the Draft EIR because the criteria listed in CEQA Guidelines Appendix G (Section XX, Wildfire) do not apply, given that the project site is not located in or near State Responsibility Areas or lands classified as Very High Fire Hazard Severity Zones. However, wildfire issues are addressed in *Section 4.8, Hazards and Hazardous Materials*, of the EIR.

The Notice of Preparation (NOP) prepared for the project and distributed on January 11, 2022, addressed a project that included the proposed sheet piles for strengthening the San Rafael Avenue and Beach Road levees. The project addressed in the NOP also called for increasing the height of existing seawalls along the levees while simultaneously improving public walkways and related public areas affected by the project. This potential future project is now referred to as the Flood Barrier Project. Since issuance of the NOP, in response to community concerns, the City decided to remove the Flood Barrier Project from the currently proposed project. The sheet piling project is independent from the Flood Barrier Project and, as such, it can be evaluated separately in a document that conforms to CEQA. If and when the Flood Barrier Project is proposed, a future CEQA document would be required for that project. In this EIR, the Flood Barrier Project is briefly addressed as part of the cumulative analysis found near the end of each topic section in this chapter.

4.1 AESTHETICS

INTRODUCTION

This section discusses the existing visual conditions at the Belvedere Seismic Upgrade Project (project or BUSP) site and vicinity and addresses the potential aesthetic impacts of the project. This aesthetic impact analysis is based on field observations at the project site and vicinity conducted in March 2022.

ENVIRONMENTAL SETTING

Regional and Local Setting

The project site is located in Belvedere, a city that sits at the edge of San Francisco Bay at the south end of Marin County. The city has unique geographical features such as Belvedere Island, which is developed with a number of older homes and landscaped roads and lots, and the Belvedere Lagoon, which is edged primarily by one- and two-story single-family homes. San Francisco Bay adjoins the city to the north, west and south, and pathways along the waterfront provide public access to this visual and open space amenity. In addition to residential development, Belvedere has small-scale commercial uses as well as recreational uses such as a marina at the San Francisco Yacht Club.

Project Site Setting and Views

Beach Road and San Rafael Avenue, the location of the project, are two-lane paved roads that abut San Francisco Bay. Beach Road has paved sidewalks along both sides of the road, with the south side providing uninterrupted views of San Francisco Bay, the marina, portions of Angel Island, and the city of San Francisco in the distance. Figure 4.1-1 (a and b) shows views along Beach Road. From Beach Road, one can see the existing concrete wall that edges the Bay. Two-story residences are located on the north side of Beach Road, and the historic China Cabin and additional one- and two-story residences are located on the south side, built on piers over the water. A landscaped median strip is located along the middle of Beach Road.

Along San Rafael Avenue, landscaped paths on the north side of the street provide uninterrupted views toward San Francisco Bay and Mount Tamalpais to the north and northwest. These paths have intermittent shrubbery plantings separating the pathway from the extensive riprap that has been placed along the shoreline for protection from wave action. Landscaped median strips also separate the pathway from the paved portion of this two-lane road. Nearly all of the south and southeast sides of San Rafael Avenue include one- and two-story single-family homes, separated from San Rafael Avenue by a paved sidewalk. Figure 4.1-2 (a through c) shows views along San Rafael Avenue.

a. View looking west along Beach Road towards Belvedere Island.

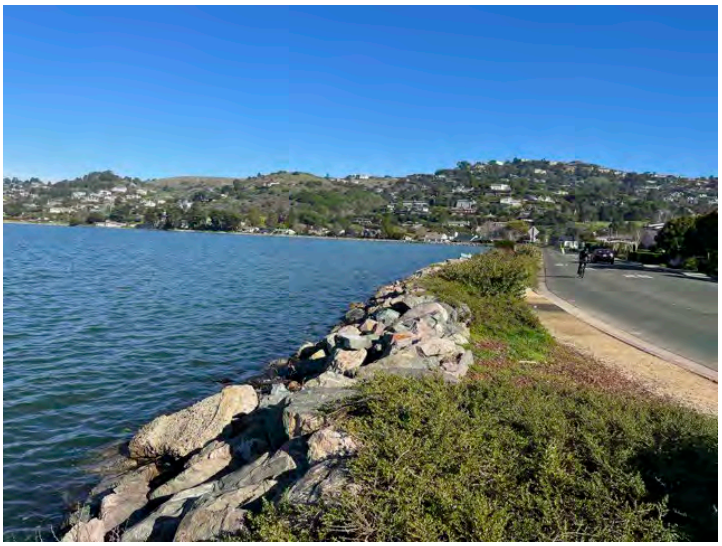
b. View east along Beach Road towards waterfront homes.

Figure 4.1-1

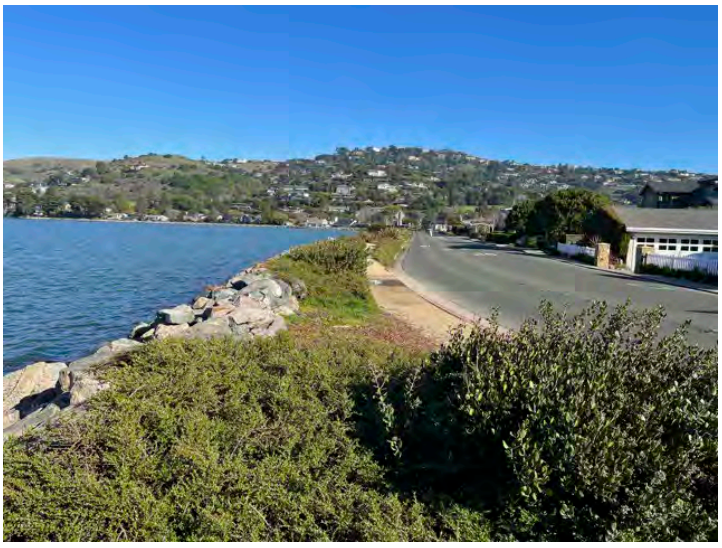
SOURCE: A. Skewes, 2022

VIEW OF THE SITE ALONG BEACH ROAD

a. View west along San Rafael Avenue with Marin hills in background.



b. View east along San Rafael Avenue with Tiburon hills in background.



c. View east along San Rafael Avenue.

Figure 4.1-2

SOURCE: A. Skewes, 2022

VIEWS OF THE SITE ALONG SAN RAFAEL AVENUE

REGULATORY FRAMEWORK

Federal and State Regulations

No federal regulations related to visual quality would pertain to the project.

The State of California has a formal program related to scenic highways. The California Scenic Highway Program, established in 1963, identifies and designates certain highways along which adjoining land uses and features require special conservation treatment. Responsibility for the management of the program is left to local cities and counties. Highways shown as "eligible" for listing are believed to have outstanding scenic values. Once a highway is listed in California Streets and Highways Code Sections 263.1 through 263.8, it may be nominated for official designation by the local governing body with jurisdiction over the lands adjacent to the proposed scenic highway. A visual assessment is required, and a number of other steps must be followed. There are no highways in the immediate vicinity of the project site, and none of the roadways in the vicinity are included in the Streets and Highways Code list of eligible highways or are designated a scenic highway (California Department of Transportation, 2022).

Local Regulations and Policies

City of Belvedere General Plan

The Community Design Element of the City's General Plan (City of Belvedere, 2010) addresses design issues and recommendations for development throughout Belvedere. The following are some of the guidelines that are relevant to infrastructure development. However, the project would be a temporary construction project of buried sheet piles that would not be visible following installation. Therefore, many of these policies would not be relevant. Landscaping policies are included because some landscaping may need to be replaced following construction.

Policy CD-7.1 Garage location, drives, parking location, and circulation should balance functional and aesthetic objectives, and should not impair neighbor's privacy, access, or views.

Action CD-7.1.1 Walkways, driveways, curb cuts and off-street parking should be planned and designed so as to minimize interference with smooth traffic flow, encourage separation of pedestrian from vehicular traffic, and be as safe and convenient as is practical.

Action CD-7.1.2 Design and location of walkways, driveways, curb cuts and off-street parking should not be out of relationship with the design of the proposed buildings and structures on the site, and should not impair the access, privacy, or views of neighboring properties.

Policy CD-10.1 Landscape plans should be compatible with the character of the site and surrounding developed properties.

Action CD-10.1.1 Native or natural-appearing vegetation, with generally rounded, natural forms, should be placed to appear as loose, informal clusters.

Action CD-10.1.2 Landscape plans shall include appropriate planting to soften or screen the appearance of structures as seen from off-site locations and shall include appropriate screening for architectural elements, such as building foundations, deck supports and retaining walls, that cannot be mitigated through architectural design.

Action CD-10.1.3 Landscape plans should provide privacy between properties. Choice of landscape materials should take into consideration the future impact that new planting may have in significantly obstructing views from nearby dwellings.

Action CD-10.1.4 Landscape plans shall include appropriate planting to repair, reseed and/or replant disturbed areas to prevent erosion.

Policy CD-10.2 Landscape materials should maintain the character of the neighborhood and be appropriate for the neighborhood climate.

Action CD-10.2.1 Plant materials that are drought-tolerant, and preferably native to northern California and Marin County, are encouraged.

Action CD-10.2.2 Plant materials and plans should be suitable for the neighborhood microclimate.

Action CD-10.2.3 Evergreen species are encouraged for use in screen planting situations. Because of high water usage, turf areas should be minimized and narrow turf areas, such as in parking strips, should be avoided.

Action CD-10.2.4 Landscape plans should include a mix of fast- and slow-growing plant materials. Fast-growing trees that have a short life span should be used only when planted with others which reach maturity at a later age.

Action CD-10.2.5 Landscape plans should include water-conserving irrigation systems. While irrigation will probably be required initially in order to establish the new plants, the plant material should be selected so that once established, much of the major site landscaping will survive solely on rainfall.

Action CD-10.2.6 In creating landscape plans, designers should be versed in the requirements to provide buffer areas of fire-resistant plantings surrounding buildings, consistent with Tiburon Fire Protection District Standards.

City of Belvedere Zoning Ordinance

The project would be located within the right-of-way of Beach Road or San Rafael Avenue and no zoning designations apply to these roadways. Therefore, development standards related to visual quality would not apply. In addition, the installation of sheet piles would be a temporary visual change during construction, and the work would not be visible after installation.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Significance Criteria

For the purposes of this Draft Environmental Impact Report (EIR) and based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines, implementation of the proposed project would have a significant effect on visual resources if it would:

1. Have a substantial adverse effect on a scenic vista;
2. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
3. In non-urbanized areas, substantially degrade the existing visual character or quality of public views[1] of the site and its surroundings or, if the project is in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality; or
4. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

The following significance criteria would not apply to the proposed project and are therefore excluded from further discussion in this impact analysis:

- *Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.* No designated state scenic highway is located within this portion of Marin County. In addition, no historic resources, trees, or rock outcroppings are located at the project site. The historic China Cabin is located just south of Beach Road but Is not likely to have any substantial damage that would affect its visual characteristics. *Section 4.4, Cultural Resources*, of this EIR addresses potential damage to this historic resource due to the project's potential vibration impacts. Any vibration impacts are expected to be minor and not likely to result in any substantial changes to the architecture of the building.
- *In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings, or, if the project is in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality.* The project site is located within an urbanized area of the City of Belvedere and is a temporary construction-related project that would not be visible or alter the visual surroundings after completion of construction. Therefore, the portion of this criterion dealing with public views does not apply. However, impacts on public views are addressed in the discussion of project consistency with scenic quality regulations (see "Less-than-Significant Impacts" below). The project would be located in an urbanized area, but within the right-of-way of Beach Road or San Rafael Avenue, where no zoning designations apply. Therefore, zoning and other regulations governing scenic quality would not apply.
- *Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.* No permanent lighting would be associated with the project. During construction, there could be some limited temporary lighting during early evening hours, but this would be short-term and less than significant.

[1] Public views are those that are experienced from publicly accessible vantage points.

Less-than-Significant Impacts

Impacts on Scenic Vistas and Views

The project would not have a substantial adverse effect on a scenic vista.

The project site roads, Beach Road and San Rafael Avenue, both provide uninterrupted scenic vistas across San Francisco Bay. The proposed project would entail the installation of sheet piles that would be placed entirely underground except at the edge of Beach Road, where the new sheet pile would be above the ground surface similar to what currently exists as shown in Figure 4.1-3. Thus, there would be no visible change from existing conditions.

During construction, existing paving and some soil along Beach Road and San Rafael Avenue would be removed, and waste material would be stockpiled on the site and at the staging areas (see *Chapter 3, Project Description*, of this EIR). During construction, temporary visual impacts would occur for visitors and residents in the vicinity of where sheet piles would be driven. However, no long-term visual impacts would occur. All construction debris would be hauled away. Sheet piles would be driven underground and new paving would be placed on top of the sheet piles. Concrete caps would also be placed on top of the buried sheet piles just below compacted backfill. Any disturbed landscaping would be restored following construction. No significant visual impacts would result, as the visual impacts during construction would be short-term and temporary.

Potentially Significant Impacts

No potentially significant impacts would result from the project.

Cumulative Impacts

Approved or currently pending development projects in Belvedere are discussed in *Chapter 6, Other CEQA Considerations,* of this EIR. The Mallard Pointe Project, located at 1-22 Mallard Road about 1,000 feet north of the Beach Road portion of the BUSP, would be visually separated from the project and therefore no cumulative visual impacts would result. The Flood Barrier Project would have visual impacts related to raising the elevation of the existing levees/walls along Beach Road and San Rafael Avenue. However, the BUSP would not contribute to those visual impacts, as the sheet piles would be placed entirely underground. Therefore, no significant cumulative visual impacts are anticipated.

REFERENCES

California Department of Transportation, 2022. Website: http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/, accessed August 30, 2022.

City of Belvedere, 2010. City of Belvedere General Plan 2030, Adopted June 9.

The left of the figure shows the existing seawall and hand rail. The 2019 sheet pile installation is located on the right along with the concrete connection to structurally support the existing seawall. New sheet piles along Beach Road that will be located bayside of the existing seawall will be installed in a similar manner.

Figure 4.1-3

SOURCE: Stetson Engineering, 2022

VIEW OF 2019 SHEETPILE INSTALLATION

4.2 AIR QUALITY

This section of the Draft Environmental Impact Report (EIR) describes the current air quality conditions in the City of Belvedere and its vicinity; discusses the regulations and policies pertinent to air quality; and assesses the potentially significant impacts on the environment that could result from implementation of the project. The analysis in this section was prepared in accordance with the Bay Area Air Quality Management District (BAAQMD) California Environmental Quality Act (CEQA) Air Quality Guidelines.

ENVIRONMENTAL SETTING

Regional Climate, Meteorology, and Topography

Belvedere is located within the San Francisco Bay Area Air Basin (SFBAAB). Some air basins have natural characteristics that limit the ability of natural processes to either dilute or transport air pollutants. The major determinants of air pollution transport and dilution are climatic and topographic factors such as wind, atmospheric stability, terrain that influences air movement, and sunshine. Wind and terrain can combine to transport pollutants away from upwind areas, while solar energy can chemically transform pollutants in the air to create secondary photochemical pollutants such as ozone. The following discussion provides an overview of the environmental setting with regard to air quality in the SFBAAB.

The San Francisco Bay Area (Bay Area) has a Mediterranean climate characterized by wet winters and dry summers. During the summer, a high-pressure cell centered over the northeastern Pacific Ocean results in stable meteorological conditions and a steady northwesterly wind flow that generally keeps storms from affecting the California coast. During the winter, the Pacific high-pressure cell weakens, resulting in increased precipitation and the occurrence of storms. The highest air pollutant concentrations in the Bay Area generally occur during inversions, when a surface layer of cooler air becomes trapped beneath a layer of warmer air. An inversion reduces the amount of vertical mixing and dilution of air pollutants in the cooler air near the surface.

Belvedere is located in the southeastern part of Marin County, which is bounded on the west by the Pacific Ocean, on the east by San Pablo Bay, on the south by the Golden Gate, and on the north by the Petaluma Gap. In southern Marin, the distance from the ocean is short and elevations are lower, resulting in higher incidence of maritime air in that area. The prevailing wind directions throughout Marin County are generally from the northwest. 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, which is located approximately 7 miles northwest of Belvedere, experiences average maximum summer temperatures in the low 80 degrees Fahrenheit and average minimum winter temperatures in the low 40 degrees Fahrenheit.

In southeastern Marin, the influence of marine air keeps pollution levels low. While Marin County does not have many polluting industries, the air quality on its eastern side — especially along the

U.S. Highway 101 corridor — may be affected by emissions from motor vehicle use within and through the county (BAAQMD, 2017a).

Air Pollutants of Concern

The California Air Resources Board (CARB) and United States Environmental Protection Agency (EPA) focus on the following air pollutants as regional indicators of ambient air quality:

- Ozone
- Coarse particulate matter (PM_{10})
- Fine particulate matter ($PM_{2.5}$)
- Nitrogen dioxide
- Carbon monoxide
- Sulfur dioxide
- Lead

These are referred to as "criteria air pollutants." In the SFBAAB, the primary criteria air pollutants of concern are ground-level ozone formed through reactions of oxides of nitrogen (NOx) and reactive organic gases (ROG), PM_{10}, and $PM_{2.5}$. Regional air pollutants, such as ozone, PM_{10}, and $PM_{2.5}$, can be formed and/or transported over long distances and affect ambient air quality far from the emissions source. The magnitude and location of specific health effects from exposure to increased ozone, PM_{10}, and $PM_{2.5}$ concentrations are the result of emissions generated by numerous sources throughout the SFBAAB, as opposed to a single project.

The BAAQMD and other air districts use regional air dispersion models to correlate the cumulative emissions of regional pollutants to potential community health effects. However, these dispersion models have limited sensitivity to the relatively small (or negligible) changes in criteria air pollutant concentrations associated with an individual project. Therefore, it is not feasible to provide reliable estimates of specific health risks associated with regional air pollutant emissions from an individual project.

The BAAQMD operates a network of air monitoring stations throughout the SFBAAB to monitor air pollutants such as ozone, PM_{10}, and $PM_{2.5}$. Table 4.2-1 presents a 5-year summary for the period from 2017 to 2021 of the highest annual concentrations of ozone, $PM_{2.5}$, and PM_{10} measured at the nearest monitoring station located at 534 4th Street in San Rafael, approximately 6.8 miles northwest of Belvedere. Table 4.2-1 also compares measured pollutant concentrations with applicable state and federal ambient air quality standards, which are discussed further under *Regulatory Framework*, below.

Localized air pollutants generally dissipate with distance from the emission source and can pose a health risk to nearby populations. Toxic air contaminants (TACs), such as diesel particulate matter (DPM), are considered localized pollutants. $PM_{2.5}$ is also considered a localized air pollutant, in addition to being considered a regional air pollutant. Air dispersion models can be used to reliably quantify the health risks to nearby receptors associated with emissions of localized air pollutants from an individual project.

The primary air pollutants of concern in the SFBAAB and their associated health risks are discussed below.

TABLE 4.2-1 AIR QUALITY TRENDS

Pollutant	Standard	2017	2018	2019	2020	2021
Ozone (O_3)	Max 1-hour Concentration (ppm)	0.088	0.072	0.096	0.086	0.082
	Days > CAAQS (0.09 ppm)	0	0	1	0	0
	Max 8-hour Concentration (ppm)	0.063	0.054	0.081	0.064	0.066
	Days > CAAQS (0.070 ppm)	0	0	1	0	0
	Days > NAAQS (0.070 ppm)	0	0	1	0	0
Coarse Particulate Matter (PM_{10})	Max 24-hour Concentration (µg/m^3)	94.0	166.0	33.0	118.0	30.0
	Days > CAAQS (50 µg/m^3)	NV	12.2	NV	6.1	0.0
	Days > NAAQS (150 µg/m^3)	NV	6.1	0.0	0.0	0.0
	Annual Arithmetic Mean (µg/m^3)	16.2	18.9	13.9	16.6	14.7
Fine Particulate Matter ($PM_{2.5}$)	Max 24-hour Concentration (µg/m^3)	74.7	167.6	19.5	155.5	29.1
	Days > NAAQS (35 µg/m^3)	8.1	13.0	0.0	9.0	0.0
	Annual Arithmetic Mean (µg/m^3)	9.7	11.1	6.4	8.7	7.0

Notes: CAAQS = California ambient air quality standards; µg/m^3 = micrograms per cubic meter; NAAQS = National ambient air quality standards; ppm = parts per million; NV = no value due to insufficient data.
State statistics are based on California-approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers. When the measured state and national concentrations varied due to different sample methods, the highest concentration was reported in the summary table.
Source: California Air Resources Board (CARB) 2022.

Ozone

While ozone serves a beneficial purpose in the upper atmosphere (stratosphere) by reducing ultraviolet radiation, it can be harmful to the human respiratory system and to sensitive species of plants when it reaches elevated concentrations in the lower atmosphere. Ozone is not emitted directly into the environment but is formed in the atmosphere by chemical reactions between ROG and NOx in the presence of sunlight. Ozone formation is greatest during periods of little or no wind, bright sunshine, and high temperatures. As a result, levels of ozone usually build up during the day and peak in the afternoon.

Sources of ROG and NOx are vehicle tailpipe emissions; evaporation of solvents, paints, and fuels; and biogenic emissions.[1] Automobiles are the single largest source of ozone precursors in the SFBAAB. Short-term ozone exposure can reduce lung function in children, facilitate respiratory infections, and produce symptoms of respiratory distress. Long-term exposure can impair lung defense mechanisms and lead to emphysema and chronic bronchitis. Ozone can also damage plants and trees and materials such as rubber and fabrics.

[1] Biogenic sources include volatile organic compounds, which include ROG, from the decomposition of vegetative matter and certain plants, such as oak and pine trees.

Particulate Matter

PM_{10} and $PM_{2.5}$ consist of extremely small, suspended particles or droplets that are 10 microns and 2.5 microns or smaller in diameter, respectively. Some sources of particulate matter are naturally occurring, such as pollen, forest fires, and windblown dust. In populated areas, however, most particulate matter is caused by road dust, combustion by-products, abrasion of tires and brakes, and construction activities. Particulate matter can also be formed in the atmosphere by condensation of sulfur dioxide and ROG.

Exposure to particulate matter can affect breathing, aggravate existing respiratory and cardiovascular disease, alter the body's defense systems against foreign materials, and damage lung tissue, contributing to cancer and premature death. Individuals with chronic obstructive pulmonary or cardiovascular disease, asthmatics, the elderly, and children are most sensitive to the effects of particulate matter.

Toxic Air Contaminants

TACs include a diverse group of air pollutants that can adversely affect human health. Unlike criteria air pollutants, which generally affect regional air quality, TAC emissions are evaluated based on estimations of localized concentrations and risk assessments. The adverse health effects a person may experience following exposure to any chemical depend on several factors, including the amount (dose), duration, chemical form, and any simultaneous exposure to other chemicals.

For risk assessment purposes, TACs are separated into carcinogens and non-carcinogens. Carcinogens are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per 1 million exposed individuals over a lifetime of exposure. Non-carcinogenic substances are generally assumed to have a safe threshold below which health impacts would not occur. Acute and chronic exposure to non-carcinogens is expressed as a hazard index, which is the sum of expected exposure levels divided by the corresponding acceptable exposure levels.

In the SFBAAB, adverse air quality impacts on public health from TACs are predominantly from DPM. Emissions of DPM and $PM_{2.5}$ generated from the exhaust of diesel-powered engines are a complex mixture of soot, ash particulates, metallic abrasion particles, volatile organic compounds, and other components that can penetrate deeply into the lungs and contribute to a range of health problems. In 1998, CARB identified DPM from diesel-powered engines as a TAC based on its potential to cause cancer and other adverse health effects (CARB, 1998). While diesel exhaust is a complex mixture that includes hundreds of individual constituents, DPM is used as a surrogate measure of exposure, under California regulatory guidelines, for the mixture of chemicals that make up diesel exhaust. More than 90 percent of DPM is less than 1 micron in diameter and is thus a subset of PM_{10} and $PM_{2.5}$ (CARB, 2016). The estimated cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other TAC routinely measured in the region.

Existing Sources and Levels of Local Air Pollution

In the Bay Area, stationary and mobile sources are the primary contributors of TACs and $PM_{2.5}$ emissions to local air pollution. In an effort to promote healthy infill development from an air quality

perspective, the BAAQMD has prepared guidance entitled Planning Healthy Places (BAAQMD, 2016). The purpose of this guidance document is to encourage local governments to address and minimize potential local air pollution issues early in the land-use planning process, and to provide technical tools to assist them in doing so. Based on a screening-level cumulative analysis of mobile and stationary sources in the Bay Area, the BAAQMD mapped localized areas of elevated air pollution that (1) exceed an excess cancer risk of 100 in a million; (2) exceed $PM_{2.5}$ concentrations of 0.8 micrograms per cubic meter; or (3) are located within 500 feet of a freeway, 175 feet of a major roadway (with more than 30,000 annual average daily vehicle trips), or 500 feet of a ferry terminal. Within these localized areas of elevated air pollution, the BAAQMD encourages local governments to implement best practices to reduce exposure to and emissions from local sources of air pollutants. According to the BAAQMD, elevated levels of $PM_{2.5}$ and/or TAC pollution do not currently extend across the project site (BAAQMD, 2019).

Existing Sensitive Receptors

Sensitive receptors are areas where individuals are more susceptible to the adverse effects of poor air quality. Sensitive receptors include, but are not limited to, hospitals, schools, daycare facilities, elderly housing, and convalescent facilities. Residential areas are also considered sensitive receptors because people are often at home for extended periods, thereby increasing the duration of exposure to potential air contaminants. Existing sensitive land uses near the project site include single- and multi-family homes adjacent to the proposed sheet pile locations along San Rafael Avenue and Beach Road.

REGULATORY FRAMEWORK

This section describes the existing federal, state, regional, and local regulations related to air quality.

Federal and State Regulations

The federal EPA is responsible for implementing the programs established under the federal Clean Air Act, such as establishing and reviewing the National Ambient Air Quality Standards (NAAQS) and judging the adequacy of State Implementation Plans to attain the NAAQS. A State Implementation Plan must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs. If a state fails to enforce its implementation of approved regulations, or if the EPA determines that a State Implementation Plan is inadequate, the EPA is required to prepare and enforce a Federal Implementation Plan to promulgate comprehensive control measures for a given State Implementation Plan.

CARB is responsible for establishing and reviewing the California Ambient Air Quality Standards (CAAQS), developing and managing the California State Implementation Plans, identifying TACs, and overseeing the activities of regional air quality management districts. In California, mobile emissions sources (e.g., construction equipment, trucks, and automobiles) are regulated by CARB and stationary emissions sources (e.g., industrial facilities) are regulated by the regional air quality management districts.

The CAAQS and NAAQS, which were developed for criteria air pollutants, are intended to incorporate an adequate margin of safety to protect the public health and welfare. California also has ambient air quality standards for sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. To achieve CAAQS, criteria air pollutant emissions are managed through control measures described in regional air quality plans as well as emission limitations placed on permitted stationary sources.

In accordance with the federal Clean Air Act and California Clean Air Act, areas in California are classified as either in attainment, maintenance (i.e., former nonattainment), or nonattainment of the NAAQS and CAAQS for each criteria air pollutant. To assess the regional attainment status, the BAAQMD collects ambient air quality data from over 30 monitoring sites within the SFBAAB. Based on current monitoring data, the SFBAAB is designated as a nonattainment area for ozone, PM_{10}, and $PM_{2.5}$, and is designated an attainment or unclassified area for all other pollutants (see Table 4.2-2).

Regulation of TACs, referred to as hazardous air pollutants (HAPs) under federal regulations, is achieved through federal, state, and local controls on individual sources. The air toxics provisions of the federal Clean Air Act require the EPA to identify HAPs that are known or suspected to cause cancer or other serious health effects to protect public health and welfare, and to establish National Emission Standards for Hazardous Air Pollutants. California regulates TACs primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act created California's program to identify and reduce exposure to TACs. To date, the CARB has identified over 21 TACs and adopted the EPA's list of 188 HAPs as TACs. The Hot Spots Act supplements the Tanner Act by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

Bay Area Air Quality Management District Responsibilities

The BAAQMD is primarily responsible for ensuring that the NAAQS and CAAQS are attained and maintained in the SFBAAB. The BAAQMD fulfills this responsibility by adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits, inspecting stationary sources of air pollutants, responding to citizen complaints, and monitoring ambient air quality and meteorological conditions. The BAAQMD also awards grants to reduce motor vehicle emissions and conducts public education campaigns and other activities associated with improving air quality within the SFBAAB.

The BAAQMD's CEQA Guidelines include thresholds of significance to assist lead agencies in evaluating and mitigating air quality impacts under CEQA (BAAQMD, 2017a). The BAAQMD's thresholds establish levels at which emissions of ozone precursors (ROG and NOx), PM_{10}, $PM_{2.5}$, TACs, and odors could cause significant air quality impacts. The scientific soundness of the thresholds is supported by substantial evidence presented in the BAAQMD's Revised Draft Options and Justification Report (BAAQMD, 2009).

TABLE 4.2-2 AIR QUALITY STANDARDS AND ATTAINMENT STATUS

		CAAQS		NAAQS	
Pollutant	Averaging Time	Concentration	Attainment Status	Concentration	Attainment Status
Ozone	8-Hour	0.070 ppm	N	0.070 ppm	N
	1-Hour	0.09 ppm	N	Revoked in 2005	---
Carbon Monoxide	8-Hour	9.0 ppm	A	9 ppm	A
	1-Hour	20 ppm	A	35 ppm	A
Nitrogen Dioxide	1-Hour	0.18 ppm	A	0.100 ppm	U
	Annual	0.030 ppm	---	0.053 ppm	A
Sulfur Dioxide	24-Hour	0.04 ppm	A	0.14 ppm	A
	1-Hour	0.25 ppm	A	0.075 ppm	A
	Annual	---	---	0.030 ppm	A
Coarse Particulate Matter (PM_{10})	Annual	20 µg/m^3	N	---	---
	24-Hour	50 µg/m^3	N	150 µg/m^3	U
Fine Particulate Matter ($PM_{2.5}$)	Annual	12 µg/m^3	N	12 µg/m^3	U/A
	24-Hour	---	---	35 µg/m^3	N
Sulfates	24-Hour	25 µg/m^3	A	---	---
Lead	30-Day	1.5 µg/m^3	A	---	---
	Calendar Quarter	---	---	1.5 µg/m^3	A
	Rolling 3-Month	---	---	0.15 µg/m^3	A
Hydrogen Sulfide	1-Hour	0.03 ppm	U	---	---
Vinyl Chloride	24-Hour	0.010 ppm	U	---	---
Visibility Reducing Particles	8 Hour (10:00 to 18:00 PST)	---	U	---	---

Notes: CAAQS = California ambient air quality standards; µg/m^3 = micrograms per cubic meter; NAAQS = National ambient air quality standards; ppm = parts per million; A = Attainment; N = Nonattainment; U = Unclassified; "---" = not applicable; ppm = parts per million; µg/m^3 = micrograms per cubic meter; PST = Pacific Standard Time.
Source: Bay Area Air Quality Management District (BAAQMD), 2017b.

Bay Area Clean Air Plan

In accordance with the California Clean Air Act, the BAAQMD is required to prepare and update an air quality plan that outlines measures by which both stationary and mobile sources of pollutants can be controlled to achieve the NAAQS and CAAQS in areas designated as nonattainment. In April 2017, the BAAQMD adopted the 2017 Clean Air Plan: Spare the Air, Cool the Climate (2017 CAP). The 2017 CAP includes 85 control measures to reduce ozone precursors, particulate matter, TACs, and greenhouse gases (GHGs). The 2017 CAP was developed based on a multi-pollutant evaluation method that incorporates well-established studies and methods of quantifying health benefits; air quality regulations; computer modeling and analysis of existing air quality monitoring data and emissions inventories; and traffic and population growth projections prepared by the

Metropolitan Transportation Commission and the Association of Bay Area Governments, respectively.

City of Belvedere General Plan

The City's General Plan (City of Belvedere, 2010) includes the following policies that would apply to construction of the proposed project and were adopted for the purpose of avoiding or mitigating an environmental impact as related to air quality issues:

Policy SUST-7.3 Implement circulation improvements that reduce vehicle idling.

Action SUST-7.3.1 Enforce State idling laws for commercial vehicles, including delivery and construction vehicles.

Policy SUST-7.4 Minimize single-occupant vehicles and reduce congestion.

Action SUST-7.4.5 Require carpooling and shuttles for employees of larger construction projects.

Policy SUST-13.1 Utilize the thresholds of significance for construction-related criteria pollutant emissions as the absence/presence of Bay Area Air Quality Management District performance-based best management practices. As these best management practices may change over time at the discretion of the Bay Area Air Quality Management District, District staff shall be consulted on a case-by-case basis in order to ensure the most recent best management practices are used.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Significance Criteria

Per CEQA Guidelines Appendix G, implementation of the proposed project would result in a significant air quality impact if it would:

1. Conflict with or obstruct implementation of the applicable air quality plan;
2. 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;
3. Expose sensitive receptors to substantial pollutant concentrations; or
4. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The BAAQMD has established numerical thresholds at which emissions of air pollutants of concern (ROG, NOx, PM_{10}, $PM_{2.5}$, and TACs) and odors could cause significant air quality impacts (BAAQMD, 2017a). The BAAQMD's thresholds of significance used in this CEQA analysis are summarized in Table 4.2-3, below.

TABLE 4.2-3 BAY AREA AIR QUALITY MANAGEMENT DISTRICT (BAAQMD) PROJECT-LEVEL THRESHOLDS OF SIGNIFICANCE FOR AIR QUALITY

Impact Analysis	Pollutant	Threshold
Regional Air Quality (Construction)	ROG	54 pounds/day (average daily emission)
	NOx	54 pounds/day (average daily emission)
	Exhaust PM_{10}	82 pounds/day (average daily emission)
	Exhaust $PM_{2.5}$	54 pounds/day (average daily emission)
	Fugitive dust (PM_{10} and $PM_{2.5}$)	Best management practices
Local Community Risks and Hazards (Construction)	Exhaust $PM_{2.5}$ (project)	0.3 µg/m^3 (annual average)
	TACs (project)	Cancer risk increase > 10 in one million Chronic hazard index > 1.0
	Exhaust $PM_{2.5}$ (cumulative)	0.8 µg/m^3 (annual average)
	TACs (cumulative)	Cancer risk > 100 in one million Chronic hazard index > 10.0

Notes: ROG = reactive organic gases; NOx = oxides of nitrogen; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; µg/m^3 = micrograms per cubic meter
Source: Bay Area Air Quality Management District (BAAQMD), 2017a.

Less-than-Significant Impacts

Consistency with Applicable Air Quality Plan (Bay Area Clean Air Plan)

The project would be consistent with the Bay Area Clean Air Plan.

The BAAQMD's 2017 CAP is the applicable air quality plan for projects located in the SFBAAB. Consistency may be determined by evaluating whether the project would support the primary goals of the 2017 CAP, including applicable control measures contained within the 2017 CAP, and would not conflict with or obstruct implementation of any 2017 CAP control measures. The primary goals of the 2017 CAP are the attainment of ambient air quality standards and reduction of population exposure to air pollutants for the protection of public health in the Bay Area.

The 2017 CAP includes control measures that aim to reduce air pollution and GHGs from stationary, area, and mobile sources. The control measures are organized into nine categories: stationary sources, transportation, buildings, energy, agriculture, natural and working lands, waste, water, and super-GHG pollutants (e.g., methane, black carbon, and fluorinated gases). As described in Table 4.2-4, the project would be consistent with applicable control measures from the 2017 CAP. Therefore, the project would not conflict with or obstruct implementation of the applicable air quality plan, and the impact would be less than significant.

Emission of Criteria Air Pollutants

Other than fugitive dust emissions from soil disturbance during construction, the project would not 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.

TABLE 4.2-4 PROJECT CONSISTENCY WITH BAY AREA AIR QUALITY MANAGEMENT DISTRICT (BAAQMD) 2017 CLEAN AIR PLAN

Control Measures	Proposed Project Consistency
Stationary Source	The stationary source measures, which are designed to reduce emissions from stationary sources, are incorporated into rules adopted by the BAAQMD and then enforced by the BAAQMD's Permit and Inspection programs. Since the project does not include any stationary sources, the stationary source control measures are not applicable to the project.
Transportation	The transportation control measures are designed to reduce vehicle trips, use, miles traveled, idling, or traffic congestion for the purpose of reducing vehicle emissions. During construction, the workers would be required to park their personal vehicles outside the City of Belvedere and be transported to and from the construction area via contractor-supplied vans or buses, reducing project-related VMT and congestion on local roadways. Therefore, the project would be consistent with the transportation control measures.
Energy	The energy control measures are designed to reduce emissions of criteria air pollutants, toxic air contaminants (TACs), and greenhouse gases (GHGs) by decreasing the amount of electricity consumed in the Bay Area, as well as decreasing the carbon intensity of the electricity used by switching to less GHG-intensive fuel sources for electricity generation. Since these measures primarily apply to electrical utility providers, the energy control measures are not applicable to the project. Note that electricity in the City of Belvedere is currently supplied by Pacific Gas and Electric Company, which supplies 93 percent of its electric power mix from a combination of renewable and carbon-free sources.[a]
Buildings	The BAAQMD has authority to regulate emissions from certain sources in buildings such as boilers and water heaters but has limited authority to regulate buildings themselves. Therefore, the building control measures focus on working with local governments that have authority over local building codes to facilitate adoption of best practices and policies to control GHG emissions. Since the project does not include any building construction, the building control measures are not applicable to the project.
Agriculture	The agricultural control measures are designed to primarily reduce emissions of methane. Since the project does not include any agricultural activities, the agricultural control measures are not applicable to the project.
Natural and Working Lands	The control measures for the natural and working lands sector focus on increasing carbon sequestration on rangelands and wetlands, as well as encouraging local governments to adopt ordinances that promote urban-tree plantings. Since the project does not include the disturbance of any rangelands or wetlands, the natural and working lands control measures are not applicable to the project.
Waste Management	The waste management measures focus on reducing or capturing methane emissions from landfills and composting facilities, diverting organic materials away from landfills, and increasing waste diversion rates through efforts to reduce, reuse, and recycle. The proposed project would comply with local requirements for waste management. Therefore, the project would be consistent with the waste management control measures.
Water	The water control measures to reduce emissions from the water sector will reduce emissions of criteria pollutants, TACs, and GHGs by encouraging water conservation, limiting GHG emissions from publicly owned treatment works (POTWs), and promoting the use of biogas recovery systems. Since these measures apply to POTWs and local government agencies (and not individual projects), the water control measures are not applicable to the project.
Super GHGs	The super-GHG control measures are designed to facilitate the adoption of best GHG control practices and policies through the BAAQMD and local government agencies. Since these measures do not apply to individual developments, the super-GHG control measures are not applicable to the project.

[a] Pacific Gas and Electric Company (PG&E), 2022.

Source: Bay Area Air Quality Management District (BAAQMD), 2017c.

Criteria Air Pollutants from Construction

Project construction activities would generate criteria air pollutant emissions that could potentially affect regional air quality. During construction, the primary pollutant emissions of concern would be ROG, NOx, PM_{10}, and $PM_{2.5}$ from the exhaust of off-road construction equipment and on-road construction vehicles related to worker vehicles, vendor trucks, and haul trucks. In addition, fugitive dust emissions of PM_{10} and $PM_{2.5}$ would be generated by soil disturbance and demolition activities, and fugitive ROG emissions would result from paving. The project's emissions of fugitive dust during construction are analyzed separately below, under Impact AIR-1.

The BAAQMD recommends using the most current version of the California Emissions Estimator Model (CalEEMod Version 2022.1) to estimate construction and operational emissions of pollutants resulting from a proposed project. CalEEMod uses widely accepted models for emission estimates combined with appropriate default data for a variety of land-use projects that can be used if site-specific information is not available. The primary input data used to estimate emissions associated with construction of the project contain information on construction duration, construction-related vehicle trips, and off-road construction equipment inventory and usage. A summary of the assumptions for estimating construction emissions is provided in Table 4.2-5. Construction information and a copy of the CalEEMod report for the proposed project, which summarizes the input parameters, assumptions, and findings, are included as Appendix B.

TABLE 4.2-5 CONSTRUCTION ASSUMPTIONS FOR CALIFORNIA EMISSIONS ESTIMATOR MODEL (CALEEMOD)

CalEEMod Input Category	Construction Assumptions and Changes to Default Data
Construction Phase	The project contains two construction phases: construction along San Rafael Avenue and construction along Beach Road. The duration of each construction phase is included in Appendix B.
Construction Equipment	The on-site construction equipment list was modified according to site-specific construction information provided by the City of Belvedere (Appendix B).
Worker, Vendor, and Hauling Trips	Construction-related vehicle trips, fleet mix, one-way travel distance, and trip activity are included in Appendix B.
	Default worker trips for each construction phase were modified based on the weighted-average number of workers trips and trip lengths (worker commute trips and contractor-supplied vans trips).
	Default vendor trips were modified according to applicable project information.
	Default hauling trips for each construction phase were modified based on the weighted-average number of hauling trips and trip lengths for each truck trip activity (e.g., soil haul trips and sheet pile trips).
	Supporting calculations are provided in Appendix B.

Notes: Default CalEEMod data used for all other parameters are not described.
Source: Construction information provided by the City of Belvedere and a copy of CalEEMod report are provided in Appendix B.

To analyze daily emission rates, the total emissions estimated during construction were averaged over the total working days (218 days) and compared to the BAAQMD's thresholds of significance. As shown in Table 4.2-6, the project's estimated emissions for ROG, NOx, and exhaust PM_{10} and $PM_{2.5}$ during construction were below the thresholds of significance and, therefore, would not result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment. Therefore, this impact is less than significant.

TABLE 4.2-6 ESTIMATED PROJECT CONSTRUCTION EMISSIONS (POUNDS PER DAY)

Emissions Scenario	ROG	NOx	Exhaust PM_{10}	Exhaust $PM_{2.5}$
Construction Emissions	1.1	11.9	0.18	0.18
Thresholds of Significance	54	54	82	54
Threshold Exceedance?	No	No	No	No

Notes: ROG = reactive organic gases; NOx = oxides of nitrogen; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter
Source: A copy of California Emissions Estimator Model (CalEEMod) report is provided in Appendix B.

Criteria Air Pollutants from Operation

The project is a seismic upgrading project with sheet pile installation, and its operation would not generate criteria pollutant emissions. Therefore, project operation would not result in a cumulatively considerable net increase in criteria air pollutants concentrations for which the region is in nonattainment.

Exposure of Sensitive Receptors to Substantial Pollutant Concentrations

The project would not expose sensitive receptors to substantial pollutant concentrations.

Toxic Air Contaminants from Construction

Project construction would generate DPM and $PM_{2.5}$ emissions from the exhaust of off-road diesel construction equipment. The annual average concentrations of DPM and exhaust $PM_{2.5}$ during construction were estimated within 1,000 feet of the project using the U.S. Environmental Protection Agency's Industrial Source Complex Short Term (ISCST3) air dispersion model. For this analysis, emissions of exhaust $PM_{2.5}$ were used as a surrogate for DPM, which is a reasonable assumption because more than 90 percent of DPM is less than 1 micron in diameter. The input parameters and assumptions used for estimating emission rates of DPM and $PM_{2.5}$ from off-road diesel construction equipment are included in Appendix B.

Daily emissions from construction were assumed to occur over the permitted construction hours from 8:00 AM to 5:00 PM Monday through Friday. The exhaust from off-road equipment was represented in the ISCST3 model as an area source with a release height of 5 meters to represent the mid-range of the expected plume rise from frequently used construction equipment.

A uniform grid of receptors spaced 15 meters apart with receptor heights of 1.8 meters (for ground-level receptors) was encompassed around the project site as a means of developing isopleths (i.e., concentration contours) that illustrate the air dispersion pattern from the various emission sources. The ISCST3 model input parameters included 3 years of BAAQMD meteorological data from Station 3901 located about 7.1 miles northwest of the project.

The two portions of the project along San Rafael Avenue and Beach Road are about 0.68 mile away from each other. Therefore, separate sensitive receptors were evaluated for each portion of the project. Based on the annual average concentrations of DPM and $PM_{2.5}$ estimated using the air dispersion model (Appendix B), potential health risks were evaluated for the maximally exposed

individual resident (MEIR) located adjacent to each portion of the project site along San Rafael Avenue and Beach Road, respectively. The locations of the MEIRs are shown in Figure 4.2-1.

In accordance with guidance from the BAAQMD (BAAMQD, 2012) and Office of Environmental Health Hazard Assessment (OEHHA, 2015), the health risk assessment calculated the incremental increase in cancer risk and chronic hazard index (HI) to sensitive receptors from DPM emissions during construction. The acute HI for DPM was not calculated because an acute reference exposure level for DPM has not been approved by OEHHA and CARB, and the BAAQMD does not recommend analysis of acute non-cancer health hazards from construction activity. The annual average concentration of DPM at the MEIR was used to conservatively assess potential health risks to nearby sensitive receptors.

The incremental increase in cancer risk from on-site DPM emissions during construction was assessed for a young child exposed to DPM starting from age zero. This exposure scenario represents the most sensitive individuals who could be exposed to adverse air quality conditions in the vicinity of the project site. Construction activities on San Rafael Avenue and Beach Road are expected to last 4 months and 5 months, respectively. OEHHA recommends that exposure from projects longer than 2 months but less than 6 months be assumed to last 6 months. It was conservatively assumed that the MEIRs along San Rafael Avenue and Beach Road would be exposed to an annual average DPM concentration over the entire estimated duration of construction at each location, which was assumed to be 6 months for San Rafael Avenue and 6 months for Beach Road, consistent with OEHHA guidance. The input parameters and results of the health risk assessment are included in Appendix B.

Table 4.2-7 summarizes the estimated health risks at the MEIRs due to DPM and $PM_{2.5}$ emissions from project construction and compares them to the BAAQMD's thresholds of significance. The estimated cancer risks and chronic HIs for DPM, and annual average $PM_{2.5}$ concentration from construction emissions were below the BAAQMD's threshold at both MEIR locations. Therefore, project construction would not expose sensitive receptors to substantial pollutant concentrations and the impact would be less than significant.

TABLE 4.2-7 HEALTH RISKS AT MAXIMALLY EXPOSED INDIVIDUAL RESIDENT (MEIR) DURING PROJECT CONSTRUCTION

	Diesel Particulate Matter		Exhaust $PM_{2.5}$
Construction Location	Cancer Risk (per million)	Chronic Hazard Index	Annual Average Concentration ($\mu g/m^3$)
MEIR – San Rafael Avenue	8.2	0.02	0.12
MEIR – Beach Road	5.7	0.02	0.08
BAAQMD's Thresholds of Significance	10	1	0.3

Note: $PM_{2.5}$ = fine particulate matter, $\mu g/m^3$ = micrograms per cubic meter
Source: See Appendix B.

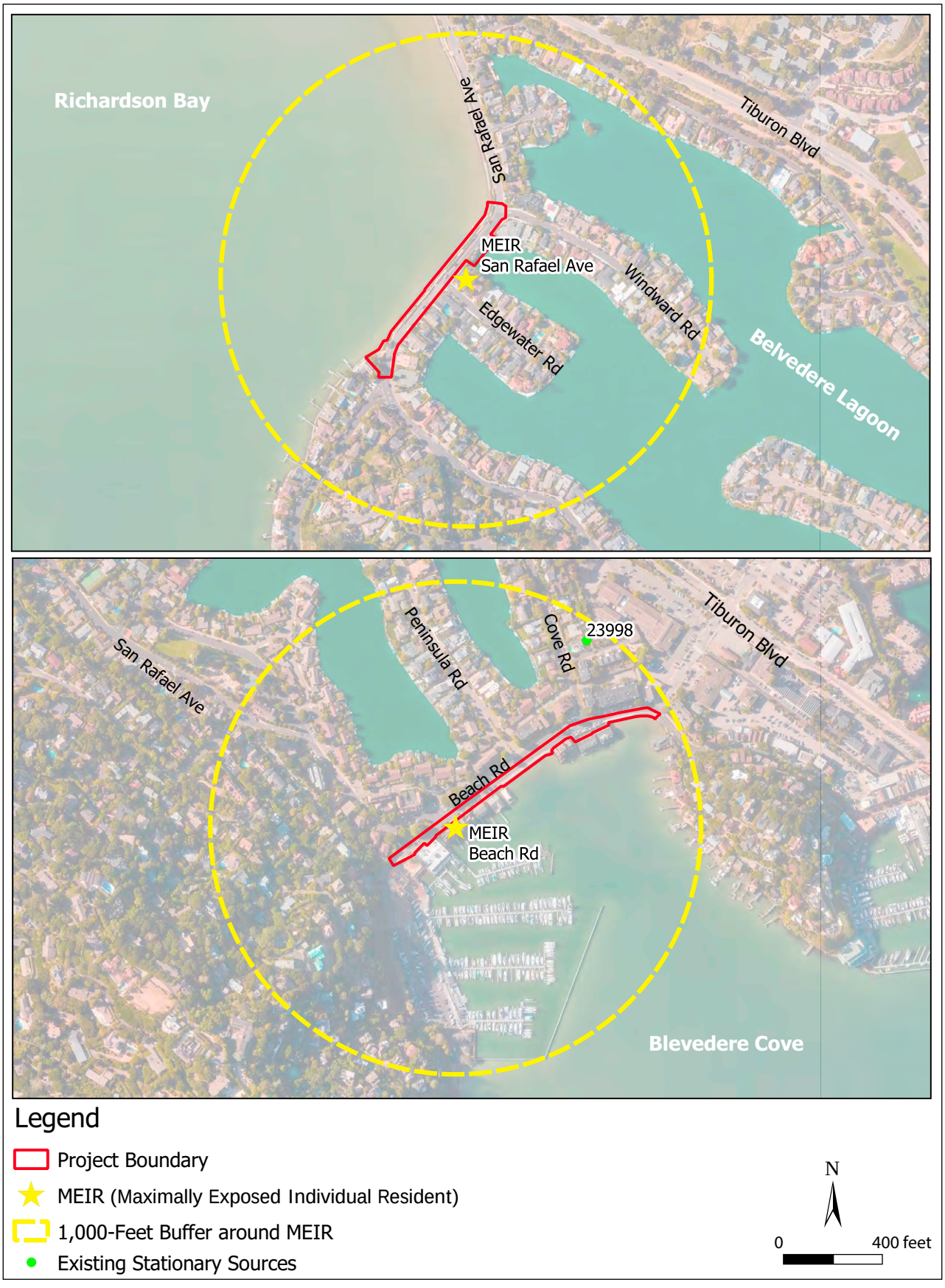


Figure 4.2-1

SOURCE: Baseline Environmental Consulting, 2022

CUMULATIVE SOURCES OF TACS AND PM2.5 EMISSIONS

Toxic Air Contaminants from Operation

The proposed project would not add any stationary source (e.g., diesel emergency generator) that would generate TACs such as DPM and $PM_{2.5}$. Therefore, project operation would not expose sensitive receptors to substantial pollutant concentrations and the impact would be less than significant.

Odor and Other Emissions

The project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

As a seismic upgrading project with sheet piling installation, the project would not be expected to generate significant odors for a substantial duration. Therefore, project impacts related to odors would be less than significant.

Potentially Significant Impacts

Impact AIR-1: Soil disturbance activities during project construction would generate fugitive dust emissions of coarse particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$) that could result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment. (PS)

The generation of fugitive dust PM_{10} and $PM_{2.5}$ emissions from soil disturbance activities could result in a cumulatively considerable net increase in regional PM_{10} and $PM_{2.5}$ concentrations. The BAAQMD does not have a quantitative threshold of significance for fugitive dust PM_{10} and $PM_{2.5}$ emissions; however, the BAAQMD considers implementation of best management practices to control dust during construction sufficient to reduce air quality impacts from fugitive dust to a less-than-significant level. The BAAQMD's recommended best management practices for controlling dust are included in Mitigation Measure AIR-1, below.

> *Mitigation Measure AIR-1: During project construction, the contractor shall implement a dust control program that includes the following measures recommended by the Bay Area Air Quality Management District (BAAQMD) and these measures shall be included in contract specifications for construction of the project:*
>
> - *All exposed surfaces (e.g., parking areas, 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 miles per hour (mph).*
> - *All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.*

- *Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 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.*
- *All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.*
- *A publicly visible sign shall be posted with the telephone number and person to contact at the City of Belvedere 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.*

Implementation of these measures would ensure that emissions of coarse particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$) from dust generated during project construction activities would not result in a cumulatively considerable net increase in criteria air pollutants for which the region is in nonattainment, and this impact would be less than significant. (LTS)

Cumulative Impacts

This analysis evaluates whether the impacts of the proposed project, together with the impacts of approved or currently pending projects, would result in a cumulatively significant impact with respect to air quality. This analysis then considers whether or not the incremental contribution of the impacts associated with implementation of the proposed project would be significant. Both conditions must apply for a project's cumulative effects to rise to the level of a significant impact. For air quality, the geographic scope for assessing cumulative impacts includes sources within 1,000 feet of the project site.

Criteria Air Pollutants

According to the BAAQMD, regional air pollution is largely a cumulative impact. No single project is sufficient in size to independently create regional nonattainment of ambient air quality standards. The BAAQMD's thresholds of significance for criteria air pollutants were designed to represent levels above which a project's individual emissions would result in a cumulatively considerable contribution to the SFBAAB's existing air quality conditions. Since construction and operation of the proposed project would not exceed the BAAQMD's thresholds of significance for criteria air pollutants (including ozone precursors), the cumulative impacts on regional air quality would be less than significant.

Toxic Air Contaminants

In addition to a project's individual TAC emissions during construction and operation, the potential cumulative health risks to the MEIRs from existing and reasonably foreseeable future sources of TACs were evaluated to represent the worst-case-exposure scenario for sensitive receptors in the project vicinity. The BAAQMD's online screening tools were used to provide conservative estimates of contributions of existing and foreseeable future TAC sources to cancer risk, HI, and $PM_{2.5}$ concentrations. The individual health risks associated with each source were summed to find the

cumulative health risk at the MEIRs. The supporting health risk calculations are included in Appendix B.

Based on the BAAQMD's 2018 permitted stationary source risk map, there is no existing stationary source within 1,000 feet of the San Rafael Avenue MEIR, and there is one existing stationary source within 1,000 feet of the Beach Road MEIR: Sanitary District #5 of Marin County (Plant 23998). Preliminary health risk screening values at the MEIRs were determined using the 2018 permitted stationary source inventory data (BAAQMD, 2022) and BAAQMD Health Risk Calculator (Beta Version 4.0).

Future development may include construction of a flood barrier (the Flood Barrier Project) along both portions of the project site. The Mallard Pointe Project, proposed at 1-22 Mallard Road, would be located about 2,450 feet from the San Rafael Avenue portion of the proposed project and 750 feet from the Beach Road portion of the proposed project. Neither the Flood Barrier Project nor the Mallard Pointe Project is expected to require an emergency generator or other stationary source of TACs.

Preliminary health risk screening values at the MEIRs from exposure to mobile sources of TACs were estimated based on the BAAQMD's Bay Area modeling of health risks from highways, railroads, and major roadways with an average annual daily traffic volume greater than 30,000 vehicles per day. According to the BAAQMD's modeling of mobile sources, one highway (Tiburon Boulevard) is located within the vicinity of the MEIRs.

Estimates of the cumulative health risks at the San Rafael MEIR and Beach Road MEIR are summarized and compared to the BAAQMD's cumulative thresholds of significance in Table 4.2-8 and Table 4.2-9, respectively. The estimated cancer risks and chronic HIs for DPM, and annual average $PM_{2.5}$ concentrations, were below the BAAQMD's cumulative threshold for both MEIRs. Therefore, the project's emissions of DPM and $PM_{2.5}$ during construction would have a less-than-significant cumulative impact on nearby sensitive receptors.

Odor

As discussed previously, the project is a seismic upgrading project with sheet pile installation, and hence would not be expected to generate significant odors for a substantial duration. Therefore, impacts associated with project would be less than significant related to the cumulative air quality impacts of odors and other emissions.

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TABLE 4.2-8 SUMMARY OF CUMULATIVE HEALTH RISKS AT SAN RAFAEL AVENUE MAXIMALLY EXPOSED INDIVIDUAL RESIDENT (MEIR)

Source	Source Type	Method Reference	Cancer Risk (per million)	Chronic Hazard Index	$PM_{2.5}$ ($\mu g/m^3$)
Project					
Off-Road Construction Equipment	Diesel Exhaust		8.2	0.02	0.12
Existing Mobile Sources					
Highway (Tiburon Boulevard)	Mobile	1	14.3	NA	0.06
		Cumulative Health Risks	22	<0.1	0.2
		BAAQMD's Cumulative Thresholds	100	10.0	0.8
		Exceed Thresholds?	No	No	No

Notes: $PM_{2.5}$ = fine particulate matter, $\mu g/m^3$ = micrograms per cubic meter; NA = not applicable
Health risk screening values derived using the following Bay Area Air Quality Management District (BAAQMD) tools and methodologies:
1) BAAQMD Planning Healthy Places Highway, Major Street, and Rail health risk raster files, 2014.

TABLE 4.2-9 SUMMARY OF CUMULATIVE HEALTH RISKS AT BEACH ROAD MAXIMALLY EXPOSED INDIVIDUAL RESIDENT (MEIR)

Source	Source Type	Method Reference	Cancer Risk (per million)	Chronic Hazard Index	$PM_{2.5}$ ($\mu g/m^3$)
Project					
Off-Road Construction Equipment	Diesel Exhaust		5.7	0.02	0.08
Existing Stationary Sources					
Sanitary District #5 of Marin County (Plant 23998)	Natural Gas Generators	1,2	<0.01	<0.01	<0.01
Existing Mobile Sources					
Highway (Tiburon Blvd)	Mobile	3	10.7	NA	0.05
		Cumulative Health Risks	16	<0.1	0.1
		BAAQMD's Cumulative Thresholds	100	10.0	0.8
		Exceed Thresholds?	No	No	No

Notes: $PM_{2.5}$ = fine particulate matter, $\mu g/m^3$ = micrograms per cubic meter; NA = not applicable
Health risk screening values derived using the following Bay Area Air Quality Management District (BAAQMD) tools and methodologies:
1) BAAQMD's 2018 stationary source emissions data.
2) BAAQMD's Generic Distance Multiplier Tool.
3) BAAQMD Planning Healthy Places Highway, Major Street, and Rail health risk raster files, 2014.

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4.3 BIOLOGICAL RESOURCES

INTRODUCTION

This section of the Draft Environmental Impact Report (EIR) addresses existing biological resources at the project site and provides an evaluation of the project's potential impacts on biological resources. Biological resources were identified by compiling and reviewing existing information and conducting field reconnaissance surveys of the project site. The review provided information on general resources in the area, the extent of sensitive natural communities, jurisdictional wetlands, and the distribution and habitat requirements of special-status species that have been recorded from or are suspected to occur in the Belvedere vicinity. Information reviewed included occurrence records of special-status species and sensitive natural communities maintained as part of the California Natural Diversity Data Base (CNDDB) of the California Department of Fish and Wildlife (CDFW), the *Biological Technical Report, City of Belvedere General Plan Update* (BTR) (WRA, 2008), and the Endangered Species Act consultation with the National Marine Fisheries Service (NMFS) (NMFS, 2019) and Section 401 Certification from the San Francisco Regional Water Quality Control Board (RWQCB) for the 1019 Beach Road Seawall Project (RWQCB, 2019), among other documents. Field reconnaissance surveys of the site were conducted by the EIR biologist on August 10, 2021, and May 31, 2022, to determine existing conditions and assess potential impacts of the proposed project.

ENVIRONMENTAL SETTING

The discussion below addresses existing biological resources on the project site and in the vicinity.

Existing Vegetation and Wildlife Habitat

Belvedere is a developed shoreline community bordered by the open waters of San Francisco Bay's Richardson Bay to the west and Belvedere Cove to the east (see Figure 3-5 in *Chapter 3, Project Description*, of this EIR).[1] The Belvedere Lagoon is now completely enclosed, separating the mainland of the Tiburon Peninsula from Belvedere Island and bordered by residential use. Upland areas of Belvedere are largely developed with residential and light commercial uses, containing structures, roadways, and other impervious surfaces and ornamental landscaping with scattered native woodland cover dominated by coast live oak (*Quercus agrifolia*) and California bay (*Umbellularia californica*). Trees planted in the residential neighborhoods of the site vicinity are generally non-indigenous species commonly used for landscaping, including Monterey pine (*Pinus radiata*), Monterey cypress (*Cupressus macrocarpa*), stone pine (*Pinus pinea*), crape myrtle (*Lagerstroemia indica*), blue gum eucalyptus (*Eucalyptus globulus*), black acacia (*Acacia melanoxylon*), flowering pear (*Pyrus calleryana*), and coast redwood (*Sequoia sempervirens*). Shrub and groundcover species in the site vicinity are almost exclusively non-native ornamental species such as privet hedge (*Ligustrum* spp.), English ivy (*Hedera helix*), photinia (*Photinia* spp.), and cotoneaster (*Cotoneaster* spp.).

[1] Richardson Bay and Belvedere Cove are both part of the larger San Francisco Bay.

As a result of this urbanization, biological habitats currently present in Belvedere consist primarily of non-native landscaped vegetation communities that provide only marginal habitat for native species. Native oaks, bays, other mature vegetation, cliffs, and structures provide limited habitat for native bird and bat species. However, the intensity of development within Belvedere limits biological habitat values in upland areas due to the intensity of human activity, habitat fragmentation, and lack of protective cover. Typical terrestrial species found in Belvedere are habitat generalists, such as the black tailed deer, raccoon, opossum, gray fox, red fox, fox squirrel, Bottae pocket gopher, Norway rat, house mouse, and numerous species of birds. Native and ornamental trees, shrubs, and structures provide nesting opportunities for native and non-native birds such as house finch, English sparrow, scrub jay, brown towhee, America robin, bush tit, and mourning dove.

The most important biological habitat in Belvedere is the aquatic marine habitat along the shoreline and in the surrounding open bay waters. The absence of marshland vegetation limits the habitat value of the shoreline for native wildlife, but the open waters of the bay provide foraging and resting opportunities for a variety of fish and bird species such as gulls, western and horned grebes, double-crested cormorants, surf scoters, lesser and greater scaup, and other ducks and shorebirds. At low tides, invertebrate populations in exposed intertidal areas provide foraging opportunities for resident and migratory shorebirds and waterfowl. The rock shoreline harbors small shore crabs and isopods, and the intertidal and sub-tidal zone supports native oyster, and numerous clams and mussels including Japanese littleneck and soft-shelled clams. The open waters of the bay provide dispersal and foraging opportunities for estuarine and marine fish and other aquatic life, including striped bass, California bat ray, white croaker, and leopard shark, as well as several surf perch species.

In contrast to the surrounding bay waters, the aquatic habitat value of the Belvedere Lagoon is relatively low. The lagoon is completely enclosed and maintained by the Belvedere Lagoon Property Owners Association (BLPOA). It occupies about 66 acres and averages 4 to 6 feet in depth. Gravity flow and pump station culverts under San Rafael Avenue restrict safe and effective passage of fish species into and out of the lagoon, limiting species diversity. In addition, discharges from the surrounding residential areas such as products used in yards and runoff from streets and the artificial regulation of surface water elevations reduce the viability of the aquatic habitat of this feature. However, some fish and other aquatic species are present, and mallard ducks, Canada geese, cattle egrets, and herons are frequently found foraging on the lagoon.

Special-Status Species

A record search of the CNDDB and the other relevant information sources indicate that historical occurrences of numerous plant and animal species with special status have either been recorded or are suspected to occur in the Belvedere vicinity and eastern Marin County area. Special-status species[2] are plants and animals that are legally protected by the California Endangered Species

[2] Special-status species include:
- Officially designated (rare, threatened, or endangered) and candidate species for listing by the CDFW;
- Officially designated (threatened or endangered) and candidate species for listing by the U.S. Fish and Wildlife Service;

Act (CESA) and/or Federal Endangered Species Act (FESA)[3] or other regulations, and other species that the scientific community and trustee agencies have identified as rare enough to warrant special consideration, particularly the protection of isolated populations, nesting or denning locations, communal roosts, and other essential habitat. Species protected by CESA and/or FESA often represent major constraints to development, particularly when they are wide ranging or highly sensitive to habitat disturbance and where proposed development would result in "take"[4] of these species.

Figures 4.3-1 and 4.3-2 show the distribution of special-status plant and animal species, respectively, as reported in the CNDDB within approximately 5 miles of the project site. Figure 4.3-1 also shows the reported occurrences of sensitive natural communities, and Figure 4.3-2 shows the location of critical habitat designated by the U.S. Fish and Wildlife Service (USFWS) and NMFS in the surrounding area. According to CNDDB records, no special-status plant or animal species have been reported at the project site, but a general occurrence of San Pablo song sparrow (*Melospiza melodia samuelis*) extends over Belvedere and the southwestern end of the Tiburon Peninsula, as indicated in Figure 4.3-2. San Pablo song sparrow has no legal protective status under CESA or FESA but is recognized as a Species of Special Concern (SSC) by the CDFW. It is associated with tidal marshes of San Francisco Bay no longer found at the project site. An occurrence of Point Reyes salty birds-beak (*Cordylanthus maritimus* ssp. *palustris*) has been mapped by the CNDDB along the shoreline of Richardson Bay at the north end of the San Rafael Avenue segment of the site. This species has no legal status under FESA or CESA but has a rarity rank of 1B (rare and endangered in California and elsewhere) maintained by the CNPS. It is dependent on coastal salt marsh habitat, which is no longer present near the site.

A habitat suitability analysis was conducted by the EIR biologist as part of the background review and field reconnaissance surveys, to determine the potential for presence of special-status species on the project site and in the vicinity. Information from the CNDDB inventory, the BTR, and other sources was reviewed and considered in compiling a list of special-status species known to occur in the Belvedere vicinity and eastern Marin County. A total of 39 special-status plant species and 46 special-status animal species were evaluated as part of this habitat assessment, including all of the species mapped by CNDDB in Figures 4.3-1 and 4.3-2 with known occurrences within approximately 5 miles of the project site. Information on species name, status, preferred habitat, and

- Species considered to be rare or endangered under the conditions of Section 15380 of the California Environmental Quality Act (CEQA) Guidelines, such as those with a rank of 1 or 2 in the *Inventory of Rare and Endangered Plants of California* maintained by the California Native Plant Society (CNPS); and
- Possibly other species which are considered sensitive or of special concern due to limited distribution or lack of adequate information to permit listing or rejection for state or federal status, such as those with a rank of 3 and 4 in the CNPS *Inventory* or identified as animal "Species of Special Concern" (SSC) by the CDFW.

[3] The Federal Endangered Species Act (FESA) of 1973 declares that all federal departments and agencies shall use their authority to conserve endangered and threatened plant and animal taxa. The California Endangered Species Act (CESA) of 1984 parallels the policies of FESA and pertains to native California species.

[4] FESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect" a threatened or endangered species. The USFWS further defines "harm" as including the killing or harming of wildlife due to significant obstruction of essential behavior patterns (i.e., breeding, feeding, or sheltering) through significant habitat modification or degradation. The CDFW also considers the loss of listed species habitat as "take," although this policy lacks statutory authority and case law support under CESA.

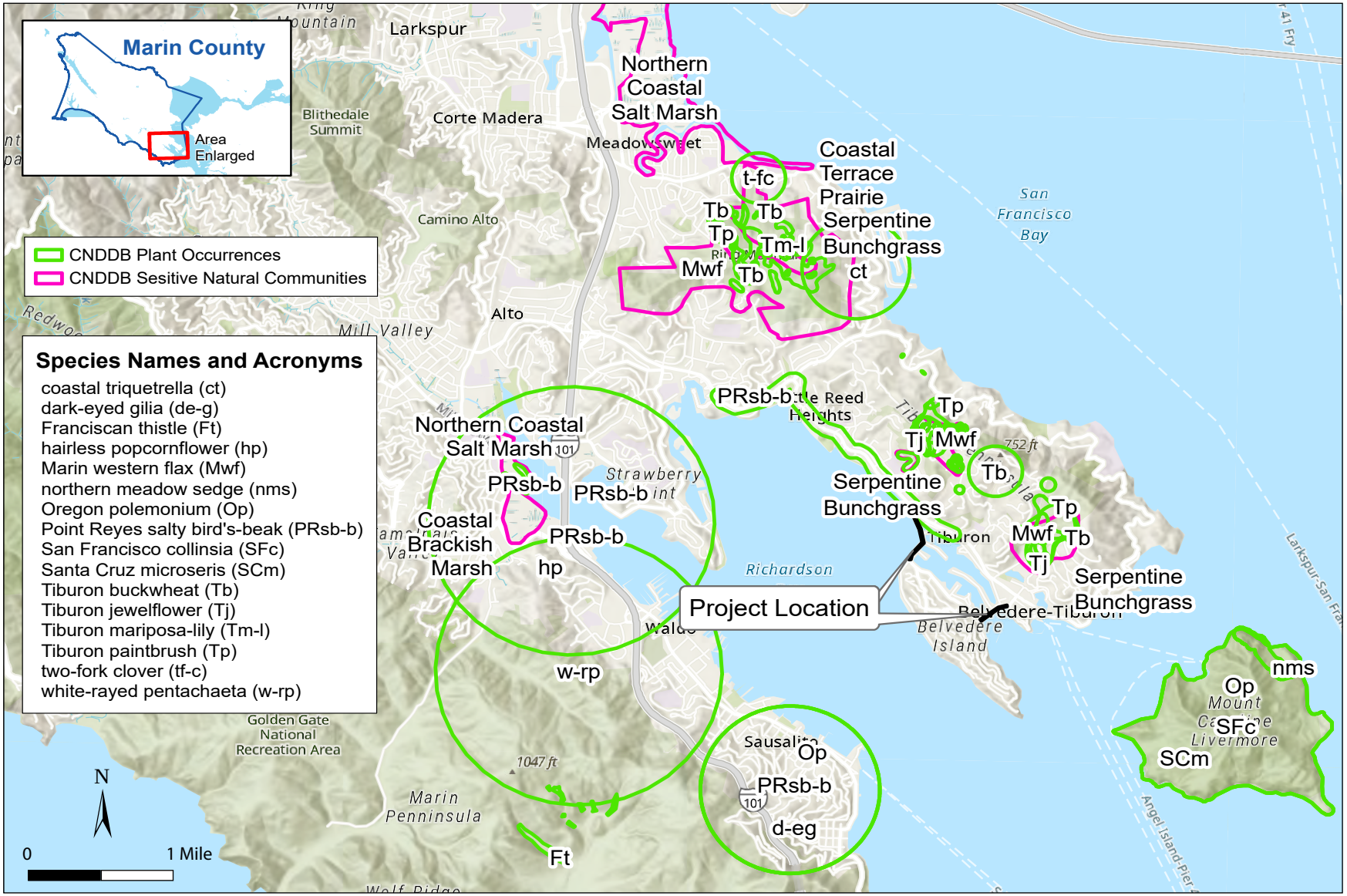
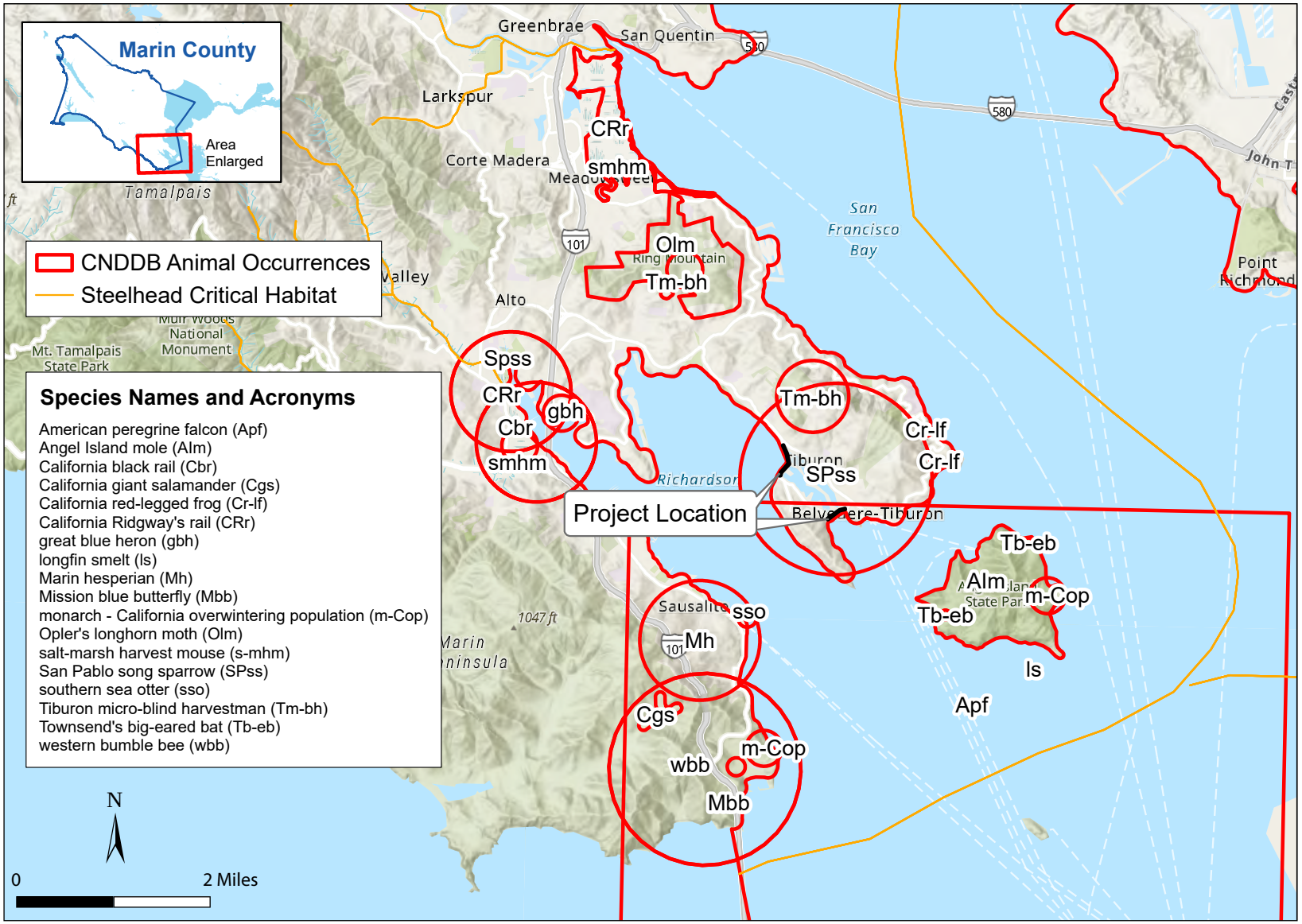


Figure 4.3-1

SPECIAL STATUS PLANTS AND SENSITIVE NATURAL COMMUNITIES

SOURCES: California Natural Diversity Database release date 4/1/2022 accessed on 4/23/2022; basemap by: ESRI; map produced by www.digitalmappingsolutions.com on 5/3/2022.



SOURCES: California Natural Diversity Database release date 4/29/2022 accessed on 5/2/2022; Department of Fish and Wildlife Critical Habitat Datasets release dates 8/15/2018 and 4/1/2022 accessed on 5/2/2022; basemap by: ESRI; map produced by www.digitalmappingsolutions.com on 5/3/2022.

Figure 4.3-2

SPECIAL STATUS ANIMALS AND CRITICAL HABITAT

the conclusion regarding potential for presence in the site vicinity was then determined. Tables 4.3-1 and 4.3-2 summarize information on these special-status plant and animal species, respectively.

Based on the habitat assessment performed during preparation of the EIR, none of the 39 special-status plant species and only 15 of the 46 wildlife species were considered to have any potential for occurrence in the vicinity of the project site (see Tables 4.3-1 and 4.3-2). The 15 wildlife species consist of 7 fish species, 5 bird species, and 3 bat species that have varying potential to occasionally disperse or forage through the site vicinity, as discussed further below. The extent of past disturbance and development precludes the potential for presence of all of the special-status plant species and most of the special-status animal species from the site vicinity. This includes absence of suitable habitat for species associated with salt marsh, freshwater marsh, and serpentine grasslands known from east Marin County—species such as the state- and federal-listed endangered salt marsh harvest mouse (*Reithrodontomys raviventris*), the state- and federal-listed endangered California Ridgway's rail (*Rallus longirostris obsoletus*), and the federal-listed threatened California red-legged frog (*Rana draytonii*), among others.

There is a low potential for presence of a number of special-status fish species in the open water habitat of Belvedere and Richardson Bay, as well as a potential for foraging by a number of special-status bird and bat species in the site vicinity, as summarized below.

Fish Species

Available information indicates that a number of special-status fish species may occur in the bay waters in the site vicinity. San Francisco Bay supports anadromous runs of Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead trout (*Oncorhynchus mykiss*), and is known to support other special-status fish species such as North American green sturgeon (*Acipenser medirostris*), longfin smelt (*Spirinchus thaleichthys*), and historically Coho salmon (*Oncorhynchus kisutch*). Table 4.3-2 provides more information on the status and preferred habitat of each of these species.

The anadromous salmonids pass through greater San Francisco Bay on their way to the ocean to rear as juveniles or to upstream areas to spawn as adults. The Evolutionarily Significant Units (ESUs) and Distinct Population Segments (DPSs)[5] of these anadromous species have various state and federal listings as threatened and endangered (refer to Table 4.3-2). Adult steelhead and adult winter-run Chinook salmon typically begin their upstream migrations in early December. Adult spring-run of Chinook salmon migrate upstream through the estuary during spring months. Juvenile steelhead and Chinook salmon migrate downstream through the estuary during the late winter and spring months. Salmonid tracking studies done as part of the Long-Term Management Strategy for Dredged Material in San Francisco Bay (known as the "LTMS") indicate that Raccoon Strait is a primary movement corridor for these anadromous species.[6]

[5] An Evolutionarily Significant Unit (ESU) is a population of organisms that is considered distinct for purposes of conservation. Delineating ESUs is important when considering conservation action. This term can apply to any species, subspecies, geographic race, or population. A Distinct Population Segment (DPS) is the smallest division of a taxonomic species permitted to be protected under FESA. Species, as defined for listing purposes under FESA, is a taxonomic species or subspecies of plant or animal, or in the case of vertebrate species, a DPS.

[6] Anadromous species are marine fish that migrate to freshwater areas to spawn.

TABLE 4.3-1 SPECIAL-STATUS PLANT SPECIES KNOWN TO OCCUR OR POTENTIALLY OCCURRING IN SITE VICINITY

Species	Status[a]	Habitat/Blooming Period	Potential for Occurrence in Site Vicinity
Amorpha californica var. napensis Napa false indigo	1B	Openings in broadleafed upland forest, chaparral, cismontane woodland. April-July	None – No suitable habitat present
Amsinckia lunaris Bent-flowered fiddleneck	1B	Coastal bluff scrub, cismontane woodland, valley and foothill grassland. March-June	None – No suitable habitat present
Arctostaphylos hookeri ssp. montana Mt. Tamalpais Manzanita	1B	Chaparral, valley and foothill grassland/serpentinite, rocky. February-April	None – No suitable habitat present
Arctostaphylos virgate Marin Manzanita	1B	Broadleafed upland forest, closed-cone coniferous forest, chaparral, North Coast coniferous forest on sandstone, or granitic substrates. January-March	None – No suitable habitat present
Calochortus tiburonensis Tiburon mariposa-lily	FT/ST	Open, rocky slopes in serpentine grassland. March-June	None – No suitable habitat present
Calamagrostis crassiglumis Thurber's reed grass	2B	Coastal scrub, freshwater marshes and swamps. May - August	None – No suitable habitat present
Carex praticola Northern meadow sedge	2B	Moist to mesic meadows and seeps on a wide variety of substrates, sometimes in forest openings or somewhat disturbed areas. May - July	None – No suitable habitat present
Castilleja affinis ssp. neglecta Tiburon paintbrush	FE/ST	Rocky serpentine sites in grasslands. April-June	None – No suitable habitat present
Chloropyron maritimum ssp. palustre Point Reyes salty bird's-beak	1B	Marshes and swamps (coastal salt), usually in coastal salt marsh with *Salicornia*, *Distichlis*, *Jaumea* and *Spartina*. June-October	None – No suitable habitat present
Chorizanthe cuspidata var. cuspidate San Francisco Bay spineflower	1B	Sandy soil on terraces and slopes in coastal bluff, coastal dunes, coastal scrub, and coastal prairie habitat. April- July (August rarely)	None – No suitable habitat present
Cirsium andrewsii *Franciscan thistle*	1B	Coastal habitats such as sea bluffs and canyons, and is sometimes found on serpentine soils. June - July	None – No suitable habitat present
Cirsium hydrophilum var. vaseyi Mt. Tamalpais thistle	1B	Serpentine seeps and streams in chaparral and woodland. May-August	None – No suitable habitat present
Collinsia multicolor San Francisco collinsia	1B	Closed-cone coniferous forest, coastal scrub. February – May	None – No suitable habitat present
Eriogonum luteolum var. caninum Tiburon buckwheat	1B	Serpentine soils; sandy to gravelly sites. May-September	None – No suitable habitat present
Fissidens pauperculus Minute pocket moss	1B	Moss growing on damp soil in coniferous forests along the coast; in dry streambeds and stream banks.	None – No suitable habitat present
Fritillaria lanceolate var. tristulis Marin checker lily	1B	Coastal scrub, valley and foothill grassland, and coastal prairie; often on serpentine; various soils reported though usually clay. February-April	None – No suitable habitat present
Gilia millefoliata *Dark-eyed gilia*	1B	Coastal dunes. April-July	None – No suitable habitat present
Helianthella castanea Diablo helianthella	1B	Broadleafed upland forest, chaparral, woodland, coastal scrub, riparian woodland, grassland. March-June	None – No suitable habitat present

Species	Status[a]	Habitat/Blooming Period	Potential for Occurrence in Site Vicinity
Hesperolinon congestum Marin western flax	FT/ST	Serpentine barrens and serpentine grassland and chaparral. April-July	None – No suitable habitat present
Holocarpha macradenia Santa Cruz tarplant	FT/SE	Light, sandy soil or sandy clay, often with non-natives in coastal prairie and grasslands. June-October	None – No suitable habitat present
Horkelia tenuiloba Thin-lobed horkelia	1B	Broadleafed upland forest, chaparral, valley and foothill grassland on sandy soils, mesic openings. May-July	None – No suitable habitat present
Kopsiopsis hookeri Small groundcone	2B	Open woods, shrubby places, generally on *Gaultheria shallon*. April-August	None – No suitable habitat present
Lessingia micradenia var. micradenia Tamalpais lessingia	1B	Usually on serpentine, in serpentine grassland or chaparral, often on roadsides. (June rarely) July-October	None – No suitable habitat present
Microseris paludosa Marsh microseris	1B	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. April-June	None – No suitable habitat present
Navarretia rosulata Marin County navarretia	1B	Closed-cone coniferous forest and chaparral on serpentinite. May-July	None – No suitable habitat present
Pentachaeta bellidiflora White-rayed pentachaeta	FE/SE	Cismontane woodland, valley and foothill grassland on open, dry rocky slopes and grassy areas, often on serpentinite. March-May	None – No suitable habitat present
Plagiobothrys glaber Hairless popcorn-flower	1A	Coastal salt marshes, alkaline meadows, and seeps. March-May	None – No suitable habitat present
Pleuropogon hooverianus North Coast semaphore grass	1B	Wet grassy, usually shady areas, sometimes in freshwater marsh, associated with forest environments. April-June	None – No suitable habitat present
Polemonium carneum *Oregon polemonium*	2B	Coastal prairie, coastal scrub, and lower montane coniferous forest. April - September	None – No suitable habitat present
Polypogon marinense Marin knotweed	3	Coastal salt marshes, brackish water marsh, and riparian wetlands. May-August	None – No suitable habitat present
Quercus parvula var. tamalpaisensis Tamalpais oak	1B	Lower montane coniferous forest. March-April	None – No suitable habitat present
Sidalcea calycosa ssp. rhizomata Point Reyes checkerbloom	1B	Freshwater marshes near the coast. April-September	None – No suitable habitat present
Stebbinsoseris decipiens Santa Cruz microseris	1B	Broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, grasslands in open areas, sometimes on serpentinite. April-May	None – No suitable habitat present
Streptanthus batrachopus Tamalpais jewel-flower	1B	Closed-cone coniferous forest, chaparral, Talus serpentine outcrops. April-June	None – No suitable habitat present
Streptanthus glandulosus ssp. Niger Tiburon jewel-flower	FE/SE	Shallow, rocky serpentine slopes in grasslands. May- June	None – No suitable habitat present
Streptanthus glandulosus ssp. pulchellus	1B	Serpentine slopes. May-July (August rarely)	None – No suitable habitat present

Species	Status[a]	Habitat/Blooming Period	Potential for Occurrence in Site Vicinity
Mount Tamalpais bristly jewel-flower			
Symphyotrichum lentum Suisun Marsh aster	1B	Marshes and swamps (brackish and freshwater); most often seen along sloughs with *Phragmites*, *Scirpus*, blackberry, *Typha*, etc. May-November	None – No suitable habitat present
Trifolium amoenum Two-fork clover	FE/1B	Coastal bluff scrub, valley and foothill grassland, sometimes on serpentinite. April-June	None – No suitable habitat present
Triquetrella californica Coastal triquetrella	1B	Grows within 30 miles from the coast in coastal scrub, grasslands, and in open gravels on roadsides, hillsides, rocky slopes	None – No suitable habitat present

[a] Status: FE = federally endangered
SE = State endangered
FT = federally threatened
ST = State threatened
CNPS Ranking:
1A = Presumed extinct in California
1B = Rare, threatened or endangered in California and elsewhere
2B = Rare, threatened, or endangered in California, but more common elsewhere
3 = A review list

TABLE 4.3-2 SPECIAL-STATUS ANIMAL SPECIES KNOWN TO OCCUR OR POTENTIALLY OCCURRING IN SITE VICINITY

Species	Status[a]	Habitat	Potential for Occurrence in Site Vicinity
Fish			
Coho salmon (Central California Coast Evolutionarily Significant Unit - ESU) *Oncorhynchus kisutch*	FE, SE	Coastal streams from Punta Gorda in northern California down to and including the San Lorenzo River in central California, as well as some tributaries to San Francisco Bay	Low – May migrate through vicinity but essential habitat absent.
Chinook salmon (Central Valley Spring-run ESU) *Oncorhynchus tshawytscha*	FT, ST	Requires clear, cool streams with pools and riffles, with coarse gravel beds for spawning. Sacramento River and its tributaries	Low – May migrate through vicinity but essential habitat absent.
Chinook salmon (Sacramento River Winter- run ESU) *Oncorhynchus tshawytscha*	FE, SE	Requires clear, cool streams with pools and riffles, with coarse gravel beds for spawning. Sacramento River and its tributaries	Low – May migrate through vicinity but essential habitat absent.
Steelhead (Central California Coast Distinct Population Segment - DPS) *Oncorhynchus mykiss*	FT	Coastal streams from Russian River south to Aptos Creek (Santa Cruz Co.), including streams tributary to San Francisco and San Pablo Bays	Low – May migrate through vicinity but essential habitat absent.
Steelhead (California Central Valley DPS) *Oncorhynchus mykiss*	FT	Spawns in Sacramento and San Joaquin Rivers and their tributaries.	Low – May migrate through vicinity but essential habitat absent.
North American green sturgeon *Acipenser medirostris*	FT, SSC	Oceanic waters, bays, and estuaries; spawns in deep pools in large, turbulent freshwater river mainstems; known to forage in estuaries and bays from San Francisco Bay to British Columbia	Low – May migrate through vicinity but essential habitat absent.
Longfin smelt *Spirinchus thaleichthys*	FC, ST	Anadromous species of northern California that uses a variety of habitats from nearshore waters to estuaries and lower segments of freshwater streams	Low – May migrate through vicinity but essential habitat absent.
Tidewater goby *Eucyclogobius newberryi*	FE, SSC	Brackish shallow lagoons and lower stream reaches where water is fairly still but not stagnant	None – No suitable habitat present
Amphibians and Reptiles			
California red-legged frog *Rana draytonii*	FT, SSC	Ponds, streams, drainages and associated uplands; requires areas of deep, still, and/or slow-moving water for breeding.	None – No suitable habitat present
California giant salamander *Dicamptodon ensatus*	SSC	Temperate forests, rivers, freshwater lakes, and freshwater marshes in northern California	None – No suitable habitat present
Western pond turtle *Actinemys marmorata*	SSC	Ponds, streams with deep pools, drainages and associated uplands for egg laying	None – No suitable habitat present
Birds			
Redhead *Aythya americana*	SSC	Large, deep bodies of water; nests in freshwater emergent wetlands	Low – May forage in vicinity but suitable nesting habitat absent.

Species	Status[a]	Habitat	Potential for Occurrence in Site Vicinity
American white pelican *Pelecanus erythrorhynchos*	SSC	Forages over shallow inland waters and coastal marine habitats, nests on isolated islands or peninsulas	Low – May forage in vicinity but suitable nesting habitat absent.
California brown pelican *Pelecanus occidentalis californicus*	D, D, CFP	Coastal shorelines and bays; rarely found on fresh water	Low – May forage in vicinity but suitable nesting habitat absent.
White-tailed kite *Elanus leucurus*	CFP	Open grasslands, meadows, or marshes; require dense- topped trees or shrubs for nesting and perching	None – No suitable habitat present
Bald eagle *Haliaeetus leucocephalus*	SE	Ocean shorelines, lake margins, and rivers for both nesting and wintering; nests in large trees with open branches	None – No suitable habitat present
Northern harrier *Circus cyaneus*	SSC	Nests in wet meadows and marshes, forages over open grasslands and agricultural fields	Low – May forage in vicinity but suitable nesting habitat absent.
Golden eagle *Aquila chrysaetos*	SSC, CFP	Rolling foothills and mountain areas. Nests in cliff- walled canyons or large trees in open areas	None – No suitable habitat present
American peregrine falcon *Falco peregrinus*	SE, CFP	A variety of open habitats including coastlines, mountains, marshes, bay shorelines, and urban areas. Nest on cliffs, bridges, and tall buildings	Low – May forage in vicinity but suitable nesting habitat absent.
California black rail *Laterallus jamaicensis coturniculus*	FT, CFP	Salt marshes bordering larger bays, also found in brackish and freshwater marshes	None – No suitable habitat present
California Ridgway's (clapper) rail *Rallus longirostris obsoletus*	FE, SE, CFP	Tidal salt marshes with sloughs and substantial cordgrass (*Spartina* sp.) cover	None – No suitable habitat present
Burrowing owl *Athene cunicularia*	SSC	Open, dry grasslands that contain abundant ground squirrel burrows	None – No suitable habitat present
Long-eared owl *Asio otus*	SSC	Conifer, oak, riparian, pinyon-juniper, and desert woodlands adjacent to grasslands, meadows, or shrublands	None – No suitable habitat present
Olive-sided flycatcher *Contopus cooperi*	SSC	Coniferous forests with open canopies	None – No suitable habitat present
Loggerhead shrike *Lanius ludovicianus*	SSC	Open grasslands and woodlands with scattered shrubs, fence posts, utility lines, or other perches; nests in dense shrubs and lower branches of trees	None – No suitable habitat present
Purple martin *Progne subis*	SSC	Woodlands; nests in tree snags and abandoned woodpecker cavities and human-made structures	None – No suitable habitat present
San Francisco (salt marsh) common yellowthroat *Geothlypis trichas sinuosa*	SSC	Salt, brackish, and freshwater marshes; and riparian woodlands; nests on or near ground in low vegetation	None – No suitable habitat present
Bryant's savannah sparrow *Passerculus sandwichensis alaudinus*	SSC	Tidal marshes and adjacent ruderal habitat, moist grasslands in the coastal fog belt, and infrequently, drier grasslands further inland; in South Bay, nests primarily on levee tops overgrown with annual grasses and levee banks dominated by pickleweed	None – No suitable habitat present
Grasshopper sparrow *Ammodramus savannarum*	SSC	Grasslands with scattered shrubs.	None – No suitable habitat present

Species	Status[a]	Habitat	Potential for Occurrence in Site Vicinity
San Pablo (Samuels) song sparrow *Melospiza melodia samuelis*	SSC	Tidal salt marshes dominated by pickleweed; nests primarily in pickleweed and marsh gumplant	None – No suitable habitat present
Tricolored blackbird *Agelaius tricolor*	SSC	Nests in dense vegetation near open water; forages in grasslands and agricultural fields.	None – No suitable habitat present
Mammals			
Salt marsh harvest mouse *Reithrodontomys raviventris*	FE, SE, CFP	Tidal salt marshes of San Francisco Bay and its tributaries. Requires tall, dense pickleweed for cover	None – No suitable habitat present
Suisun shrew *Sorex ornatus sinuosus*	SSC	Tidal and brackish marshes of the northern shores of San Pablo and Suisun Bays. Requires dense low-lying cover above the mean high tide line.	None – No suitable habitat present
Pallid bat *Antrozous pallidus*	SSC	A variety of open arid habitats (e.g., chaparral, open woodland, deserts); primary roost sites include bridges, old buildings, and in tree hollows and/or bark; sometimes roost in caves and rock crevices	Low – May forage in vicinity but suitable roosting habitat absent.
Western red bat *Lasiurus blossevillii*	SSC	Forested canyons and riparian woodlands for roosting, a variety of open habitats for foraging; typically roosts in snags and trees with moderately dense canopies	Low – May forage in vicinity but suitable roosting habitat absent.
Townsend's big-eared bat *Corynorhinus townsendii*	SSC	Occurs in a variety of habitats, but requires caves, hollow trees, mines, tunnels, buildings, or other human-made structures for roosting	Low – May forage in vicinity but suitable roosting habitat absent.
Southern sea otter *Enhydra lutris nereis*	FT, SSC, CFP	Southern sea otters, also known as California sea otters, live in the ocean waters along the central California coastline	None – No suitable habitat present
Angel Island mole *Scapanus latimanus insularis*	-	Open grasslands on Angel Island	None – No suitable habitat present
American badger *Taxidea taxus*	SSC	Open habitats with friable soils	None – No suitable habitat present
Invertebrates			
Monarch butterfly *Danaus plexippus* (overwintering population)	FC	Overwinters along California coast roosting in eucalyptus stands.	None – No suitable habitat present
Mission blue butterfly *Icaricia icarioide missionensis*	FE	Found in coastal grassland habitat with suitable lupine (*Lupinus* spp.) host plants. Remaining populations found in only a few locations around the San Francisco Bay area, including the Marin Headlands	None – No suitable habitat present
Marin Hesperian *Vespericola marinensis*	*	Found in moist spots in coastal brush fields, chaparral vegetation, and under leaves alder and evergreen forest	None – No suitable habitat present
California brackishwater snail *Tryonia imitator*	*	Found in brackish water conditions, generally from Southern California coast.	None – No suitable habitat present
Tiburon micro-blind harvestman *Microcina tiburona*	*	Found in serpentine outcrops on Tiburon Peninsula	None – No suitable habitat present

Species	Status[a]	Habitat	Potential for Occurrence in Site Vicinity
Western bumble bee *Bombus occidentalis*	-	Variety of habitats but under severe decline in western range.	None – No suitable habitat present
Opler's longhorn moth *Adela oplerella*	*	Grasslands where its larval food plant, *Platystemon californicus* (cream cups), are found.	None – No suitable habitat present

[a] Status: FE = federally endangered
FT = federally threatened
ST = State endangered
D = Delisted
SSC = California Species of Special Concern
CFP = California Fully Protected Species
* = Former federal candidate for listing

Authorization to dredge in San Francisco Bay is coordinated through the Dredged Materials Management Office (DMMO), a joint program of the U.S. Army Corps of Engineers (Corps), the Bay Conservation and Development Commission (BCDC), RWQCB, the State Lands Commission, and the U.S. Environmental Protection Agency. The USFWS, NMFS, and CDFW also participate in this program by providing consultation on special-status species issues as needed. The DMMO was created as part of the LTMS, which is a 50-year plan to manage dredged material, dredging, and disposal activities in San Francisco Bay. As part of the LTMS, guidelines and work windows for dredging have been developed to avoid and minimize impacts on physical and biological resources in the Bay. Based on LTMS work windows for central San Francisco Bay, dredging and other in-water activities preferably take place from June through October in the Belvedere vicinity as a method to minimize adverse effects on anadromous fish species.

The NMFS has designated the lands of Racoon Strait and Belvedere Cove as critical habitat for Chinook salmon and steelhead. No known salmonid bearing streams are present in the City of Belvedere but migrating adults and sub-adults of anadromous species may use Richardson Bay and Belvedere Cove for foraging. Smolts and sub-adults use the protective habitat and rich food source found within eelgrass beds for development and growth on their way out to the open ocean.

The state- and federal-listed endangered Coho salmon has been documented within San Francisco Bay but is now considered by NMFS to be extirpated from the region. As a result, the LTMS work window from June 1 through October 31 covering Coho salmon is not currently implemented for projects in the vicinity of Belvedere.

The southern DPS of North American green sturgeon is known to occupy coastal bays and estuaries, including San Francisco and San Pablo Bays. In the southern DPS, green sturgeon spawn in the deep turbulent sections of the upper reaches of the Sacramento River. As juveniles age, they migrate downstream and live in the lower delta and bays, spending from 3 to 4 years there before entering the ocean. Not enough information exists to determine specific habitat preferences within San Francisco Bay (e.g., high or low relief, channels or flats) but depths less than 10 meters may be preferred during foraging and migration. Adult green sturgeon return from the ocean every few years to spawn, and generally show fidelity to their upper Sacramento River spawning locations. Adult green sturgeon enter San Francisco Bay in late winter through early spring, and juvenile and adult green sturgeon may be present in San Francisco Bay and near the project site year-round. The waters surrounding Belvedere provide suitable rearing, feeding, and migratory habitat for juvenile and adult green sturgeon, though no spawning habitat has been documented in the vicinity. NMFS has also designated Raccoon Strait and Belvedere Cove as critical habitat for the southern DPS.

Longfin smelt is an anadromous species found in bay, estuary, and nearshore coastal environments from San Francisco Bay north to Alaska. The San Francisco Estuary and the Sacramento-San Joaquin Delta support the largest longfin smelt population in California. Most descriptions of longfin smelt life history in California focus on San Francisco Bay populations. Longfin smelt have a short lifespan, with most reaching maturity at 2 years of age. They spend their adult life in bays, estuaries, and nearshore coastal areas, and migrate into low salinity or freshwater rivers to spawn. Newly hatched larvae are buoyant and are quickly swept downstream into brackish water. Larvae are able to swim up and down in the water column, and use river and tidal currents to stay in areas where fresh and saltwater mix. Spawning occurs primarily from January through March, after which most adults die. Adults likely disperse through the open waters

of San Francisco and San Pablo Bays, foraging before moving upstream to freshwater reaches of the Sacramento-San Joaquin Delta.

Although Pacific herring (*Clupea pallasi*) has no legal protective status under CESA or FESA, the CDFW regulates this species as a fish of commercial importance. It is a schooling fish and is found in nearshore habitats along the coastlines of the North Pacific. San Francisco Bay provides breeding and rearing habitat for Pacific herring. Breeding occurs between December and March as eggs are attached to substrate such as eelgrass, rip rap, or other similar material. Eelgrass within Richardson Bay has been documented as important spawning habitat for Pacific herring. Eelgrass beds are absent in the immediate project site vicinity, but herring could disperse through the open waters as part of foraging and in search of spawning habitat.

Bird Species

Although suitable nesting habitat for most special-status bird species is absent from the project site vicinity, there is a potential for individuals to occasionally fly over the site given its location along the bay shoreline. This includes a number of species recognized as SSC by the CDFW, fully protected or with other listing status as indicated in Table 4.3-2., such as American white pelican (*Pelecanus erythrorhynchos*), Northern harrier (*Circus cyaneus*), red head (*Aythya americana*), or American peregrine falcon (*Falco peregrinus*). There is also a remote potential for special-status and more common bird species to forage in the site vicinity, but suitable nesting habitat is absent. The shoreline habitat of the bay could also be occasionally used for foraging by relatively common bird species such as great blue heron (*Ardea Herodias*), snowy egret (*Egretta thula*), black-crowned night heron (*Nycticorax nycticorax*), and double-crested cormorant (*Nannopterum auritus*). Colonial roosts of these species are of concern to the CDFW because of their sensitivity to disturbance and importance for local populations, but no records of roosts of these species have been reported in the CNDDB in the site vicinity, and no evidence of roosts was observed during the field reconnaissance surveys in 2021 and 2022.

Nests of most bird species are protected under the Migratory Bird Treaty Act (MBTA) when the nests are in active use, and nests of raptors (birds-of-prey) are also protected under State Fish and Game Code when the nests are in active use. No nesting or roosting locations have been identified in the CNDDB for the project site or immediate vicinity or were observed during the field reconnaissance surveys conducted in 2021 and 2022. However, suitable nesting substrate occurs in the mature trees along the perimeter of the site, including a remote potential for nesting by some bird species recognized as SSC by the CDFW, as well as more common species, and new nests could be established in the future. Species considered to have some potential for nesting in the site vicinity include Cooper's hawk (*Accipiter cooperi*), sharp-shinned hawk (*Accipiter striatus*), and white-tailed kite (*Elanus caeruleus*), as well as more common raptor species such as great horned owl (*Bubo virginianus*), red-tailed hawk (*Buteo jamaicensis*), and red-shouldered hawk (*Buteo lineatus*), and more common passerine species such as California scrub jay (*Aphelocoma californica*), California towhee (*Melozone crissalis*), and American robin (*Turdus migratorius*).

Bat Species

Pallid bat (*Antrozous pallidus*) and Townsend's big-eared bat (*Corynorhinus townsendii*) typically roost in caves, mines, and tree cavities, and can also use various structures such as bridges, barns, porches, bat boxes, and human-occupied as well as vacant buildings. Western red bat

(*Lasiurus blossevillii*) typically roosts in snags and trees with moderately dense canopies in riparian and forested areas. All three of these species are recognized as SSC by the CDFW because of declines in population and distribution. As indicated in Figure 4.3-2, occurrences of Townsend's big-eared bat have been reported in unoccupied structures on Angel Island. While these and other more common bat species may forage throughout the project site vicinity, no suitable roosting habitat or signs of bat occupation were observed during the field reconnaissance surveys in 2021 and 2022.

Regulated Waters

Wetlands and unvegetated other waters are generally considered to have high intrinsic biological value, and modifications to these features typically require review and authorization from state and federal agencies, as discussed below under *Regulatory Framework*. A preliminary wetland assessment was conducted during the field reconnaissance surveys in 2021 and 2022 to determine the likely extent of regulated waters in the project site vicinity. Based on a review of field conditions, wetlands including coastal salt marsh, brackish water marsh, and special aquatic habitats such as eelgrass beds dominated by eelgrass (*Zostera marina*) are absent from the site. However, regulated waters include the unvegetated upper limits to the tidal zones to Richardson Bay and Belvedere Cove and the unvegetated waters of the Belvedere Lagoon, which are connected by culverts to Richardson Bay under San Rafael Avenue. The shoreline to the tidal zone of Richardson Bay is covered in riprap to the west of San Rafael Avenue, with a pedestrian path and ornamental landscaping separating the two along an elevated levee. The shoreline to the tidal zone along the Belvedere Lagoon is formed by the existing seawall that borders the east side of Beach Road through the site. Sheet pile and concrete footings are located within the tidal zone at the base of the existing seawall where emergency repairs were installed in 2019; these footings are similar to what is proposed as part of the project. The tidal zone through this area is composed of gravels and sand, with no emergent vegetation such as eelgrass beds or coastal salt marsh vegetation.

REGULATORY FRAMEWORK

Local, state, and federal regulations have been enacted to provide for the protection and management of sensitive biological and wetland resources. This section outlines the key federal, state, and local regulations that apply to these resources.

Federal and State Regulations

The USFWS is responsible for protection of terrestrial and freshwater organisms through implementation of FESA (16 United States Code [U.S.C.] Section 1531, *et seq.*) and the MBTA (16 U.S.C. Section 703, *et seq.*). The MBTA makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations or pursuant to certain regulatory exceptions. The NMFS is responsible for protection of anadromous fish and marine wildlife under FESA, the Magnuson-Stevens Fishery Conservation and Management Act, and the Marine Mammal Protection Act. The Corps has primary responsibility for protecting wetlands under Section 404 of the Clean Water Act (CWA). The Corps also regulates navigable waters under Section 10 (33 U.S.C. 403) of the Rivers and Harbors Act.

The CDFW is responsible for administration of CESA (California Fish and Game Code, Section 2050, *et seq.*) and for protection of streams and water bodies through the Streambed Alteration Agreement process under Section 1600, *et seq.,* of the California Fish and Game Code. Certification from the RWQCB is also required when a proposed activity may result in discharge into navigable waters, pursuant to Section 401 of the CWA and Environmental Protection Agency (EPA) Section 404(b)(1) Guidelines. The RWQCB also has jurisdiction over waters of the state not regulated by the Corps under the Porter-Cologne Act.

The following discusses in more detail how state and federal regulations address special-status species and wetlands.

Special-Status Species

Special-status species are plants and animals that are legally protected under FESA and CESA, the MBTA, the California Fish and Game Code (Sections 3503, 3503.5, 3511, 3513, 3515, and 4700), or other regulations. In addition, pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15380, special-status species also include other species that are considered rare enough by the scientific community and trustee agencies to warrant special consideration, particularly with regard to protection of isolated populations, nesting or denning locations, communal roosts, and other essential habitat. These include species recognized by the CDFW as SSC, and plant species with a rank of 1A and 1B of the CNPS *Inventory*. Species with legal protection under FESA and CESA often represent major constraints to development, particularly when the species are wide ranging or highly sensitive to habitat disturbance and where proposed development would result in a take of these species.

Wetlands and Other Waters of the United States

Although definitions vary to some degree, wetlands are generally considered to be areas that are periodically or permanently inundated by surface or ground water and support vegetation adapted to life in saturated soil. Wetlands are recognized as important features on a regional and national level due to their high inherent value as habitat for fish and wildlife, use as storage areas for storm and flood waters, and water recharge, filtration, and purification functions. The CDFW, Corps, and RWQCB have jurisdiction over modifications to riverbanks, lakes, stream channels and other wetland features. Technical standards for delineating wetlands have been developed by the Corps and the USFWS, and these standards generally define wetlands through consideration of three criteria: hydrology, soils, and vegetation.

The CWA was enacted to address water pollution, establishing regulations and permit requirements regarding construction activities that affect storm water, dredge and fill material operations, and water quality standards. The regulatory program requires that discharges to surface waters be controlled under the National Pollutant Discharge Elimination System (NPDES) permit program, which applies to sources of water runoff, private developments, and public facilities. Under Section 404 of the CWA, the Corps is responsible for regulating the discharge of fill material into waters of the United States. The term “waters” includes wetlands and non-wetland bodies of water that meet specific criteria as defined in the Code of Federal Regulations. All three of the identified technical criteria must be met for an area to be identified as a wetland under Corps jurisdiction, unless the area has been modified by human activity. In general, a permit must be obtained before fill can be placed in wetlands or unvegetated other waters of the United States.

The type of permit is determined by the Corps depending on the amount of acreage and the purpose of the proposed fill.

Jurisdictional authority of the CDFW over wetland areas is established under Section 1600 of the California Fish and Game Code, which pertains to activities that would disrupt the natural flow or alter the channel, bed, or bank of any non-tidal lake, river, or stream. The Fish and Game Code stipulates that it is unlawful to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake without notifying the CDFW, incorporating necessary mitigation, and obtaining a Streambed Alteration Agreement. The Wetlands Resources Policy of the CDFW states that the Fish and Wildlife Commission will strongly discourage development in or conversion of wetlands, unless, at a minimum, project mitigation assures there will be no net loss of either wetland habitat values or acreage. The CDFW is also responsible for commenting on projects requiring Corps permits under the Fish and Wildlife Coordination Act of 1958 (16 U.S.C. Section 661, *et seq.*).

In addition, the RWQCB is responsible for upholding state water quality standards. Pursuant to Section 401 of the CWA, projects that apply for a Corps permit for discharge of dredge or fill material, and projects that qualify for a Nationwide Permit, must obtain water quality certification from the RWQCB. The RWQCB is also responsible for regulating wetlands under the Porter-Cologne Water Quality Control Act (California Water Code, Section 13000, *et seq.*); these wetlands may include hydrologically isolated wetlands no longer regulated by the Corps under Section 404 of the CWA. Recent federal Supreme Court rulings have limited the Corps jurisdiction, but the RWQCB in some cases continues to exercise jurisdiction over these features.

Local Regulations

City of Belvedere General Plan

The Sustainability and Resource Conservation Element of the City's General Plan (City of Belvedere, 2010) includes the following relevant goals, policies, and actions related to the protection of sensitive habitat:

Goal SUST-10	Protect natural habitats and biological resources including sensitive aquatic habitat, streams, and riparian corridors.
Policy SUST-10.1	Remain updated on the status of potential avoidance and mitigation measures related to potentially endangered and special status species.
Policy SUST-10.2	Regulate and mitigate the impacts of pile replacement, installation and reinforcement for structures built over water and installation and expansion of piers, docks and boat hoists.
Policy SUST-10.3	Avoid impacting, minimize disruption of, or restore native oyster populations when found in or near a project area.
Action SUST-10.3.1	Development activities shall be designed to avoid impacting areas with Olympia oyster colonies, or where avoidance is not feasible, minimization measures should be followed.

Policy SUST-10.4	Protect eelgrass colonies and individual eelgrass plants.
Action SUST-10.4.1	Development activities shall be designed to avoid impacting areas where surveys document the presence of beds and patches of eelgrass.
Action SUST-10.4.2	Permanent structures such as piers and docks shall be designed to maximize the amount of sunlight available to eelgrass, as based on the best available research.
Action SUST-10.4.3	Mitigations to eelgrass, based on the best available science, shall be implemented if avoidance and minimization measures are not feasible.
Policy SUST-10.5	Regulate and mitigate the impacts of residential construction (remodeling, expansions, and new construction) and public park redevelopment on properties in or adjacent to wetland and riparian habitat.
Action SUST-10.5.1	Development activities shall be designed to avoid impacts to streams and riparian habitat to the extent feasible, following best management procedures.
Action SUST-10.5.2	Development activities that take place near stream and riparian habitats should have adequate stream setbacks to protect habitat functions.
Policy SUST-10.6	Ensure protection of sensitive habitat when authorizing dredging of existing channels, potential dredging of the West Shore Channel, shoreline stabilization, and sea wall maintenance and replacement.
Action SUST-10.6.1	Ensure dredging projects avoid or mitigate potential damage to aquatic species and utilize avoidance measures to prevent dredging-related adverse effects to sensitive biological communities.
Action SUST-10.6.2	When dredging occurs, it must be designed to avoid eelgrass present in the area.
Action SUST-10.6.3	Adhere to appropriate seasonal work windows for dredging activities to avoid potential impacts to sensitive aquatic species migrating through the Bay. Establish pile driving work window on appropriate dredging work windows.
Action SUST-10.6.4	Cooperate with Sanctuary restrictions to ensure compliance of dredging and boat activities along the potential West Shore Channel.
Goal SUST-11	Promote healthy waterways and reduce toxics in run-off.
Policy SUST-11.1	Manage the Lagoon using the most effective, environmentally friendly methods available, considering that the waters of the Lagoon empty into Richardson Bay.

Action SUST-11.1.1	Continue to investigate ways to manage the Lagoon using the most effective, environmentally friendly methods available.
Action SUST-11.1.2	Encourage the use of non-toxic weed and pest controls on lawns and landscaping, particularly in areas surrounding the Lagoon.
Action SUST-11.1.3	Encourage minimizing the use of fertilizers, particularly in areas surrounding the Lagoon.
Goal SUST-12	Enhance the urban forest.
Policy SUST-12.1	Protect existing trees and encourage the planting of new trees.
Policy SUST-12.2	Protect the local tree canopy as habitat for nesting birds and survey trees slated for removal for nesting birds prior to permit issuance.
Policy SUST-12.3	Protect oak woodlands.
Policy SUST-12.4	Support the preservation of existing regional land conservation areas (in adjacent Tiburon and unincorporated Marin County areas) that provide carbon sequestration benefits, such as those with tree cover.
Policy SUST-12.5	Evaluate development applications for possible adverse impacts to special status birds and bats.

Belvedere Municipal Code

Chapter 8.12 of the Belvedere Municipal Code pertains to the control of hazards of personal injury and property damage due to disease or from uncontrolled growth of trees, stumps, and shrubs. The ordinance seeks to establish a process to resolve complaints related to blockage of views and sunlight from trees and other vegetation. Formal Design Review is required for landscaping changes when they affect a visually significant portion of the property. Removal of large, visually significant trees, particularly native trees that are greater than 16 inches in diameter at breast height, generally triggers formal Design Review. Tree removal work that involves working from or within the public right-of-way typically requires an Encroachment Permit from the City of Belvedere.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Significance Criteria

For the purposes of this Draft EIR, the project would have a significant impact on biological resources if it would:

1. 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 CDFW or USFWS;
2. 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 CDFW or USFWS;

3. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
4. 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;
5. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

The following significance criteria would not apply to the project and are therefore excluded from further discussion in this impact analysis:

- *Have a substantial adverse effect on any sensitive natural community.* The project site does not contain any sensitive natural communities.
- *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.* No such plans encompassing the project site or vicinity have been adopted.

Less-than-Significant Impacts

Movement of Native Resident or Migratory Fish or Wildlife Species

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.

The project site is largely developed with existing residential uses, roadways, and pedestrian sidewalks, ornamental landscaping, and riprap or concrete walls. Construction activities would disrupt existing wildlife movement and use, but this would be a temporary impact and alternative terrestrial and aquatic habitat would be available in the adjacent areas for wildlife to use for foraging and other activities during construction. As required under Mitigation Measure BIO-2 below, preconstruction surveys would be conducted to ensure project construction activities do not disrupt bird nesting and controls would be installed during construction to separate work in aquatic habitat from surrounding waters as required by regulatory agencies as part of their permit authorization. These construction controls would limit disturbance to aquatic habitat through use of turbidity curtains, lowering of the surface water elevation of the Belvedere Lagoon during sheetpile installation, restrictions on timing of work in aquatic habitat to daylight hours and outside the migratory period for special-status fish species, and timing of initial construction work associated with sheet pile installation along Beach Road to occur during low tide when bay waters have receded and the base of the existing seawall is completely exposed. Species common to urbanized areas and the shoreline habitat affected by the project would eventually continue to use the area following construction and establishment of any replacement landscaping. Fish and wildlife movement opportunities would not be substantially impeded on the site, and the project's impact would be less than significant.

Conformance with Local Plans and Policies

The project would generally conform with local plans and policies of the City of Belvedere, and no major conflicts are anticipated.

In general, the proposed project would not conflict with the relevant goals, policies, and actions in the City's General Plan (see *Regulatory Framework* above). Most components of the project would be installed in highly disturbed areas that contain pavement and ornamental landscaping. Modifications at the base of the Beach Road sheet pile installation would require limited disturbance to the intertidal zone, but most of this zone has been disturbed by past wall construction and maintenance and does not contain any sensitive coastal salt marsh, eel grass beds, or oyster beds. Construction in aquatic habitat, including the sheet pile installation in the Belvedere Lagoon and along the existing seawall along Beach Road, would be temporary in nature, timed to avoid impacts on special-status fish species, and contained with a turbidity curtain to prevent degradation of the surrounding aquatic habitat. The turbidity curtain is an effective way to isolate the construction zone and prevent sediments disturbed during excavation and other construction activities from dispersing into the surrounding bay waters. Chapter 8.12 of the Belvedere Municipal Code pertains to tree removal for view and safety reasons. No trees are proposed for removal as part of the project. If any tree or other landscaping is affected by project construction, it would be replaced and maintained as part of project implementation. Therefore, the project's impact related to conformance with local plans and policies would be less than significant.

Potentially Significant Impacts

Impact BIO-1: Special-status fish species could be adversely affected by proposed construction in the intertidal zone of Belvedere Cove. (PS)

Proposed construction in aquatic habitat near Beach Road could adversely affect special-status fish species known or suspected to occur in Richardson Bay and Belvedere Cove, including steelhead, Chinook salmon, green sturgeon, and longfin smelt. No special-status fish or other species are believed to be present in the waters of the Belvedere Lagoon because of its hydrologic isolation from Richardson Bay, poor water quality, and managed condition. Potential adverse effects on fish species associated with the shoreline and open waters of San Francisco Bay could include degraded water quality and elevated underwater sound levels during construction, as well as potential take of individuals if adequate avoidance measures are not implemented as part of the project to separate the construction zone from aquatic habitat.

Potential for Degraded Water Quality

Installing the sheet piles and implementing any required compensatory mitigation in the surrounding tidal waters would disturb the bay substrate and could elevate suspended sediment levels in the water column, potentially degrading water quality. If sediment loads in the water column remain high for an extended period of time, the primary productivity of an aquatic area could be reduced, and fish may suffer reduced feeding ability and be prone to fish gill injury. However, increased suspended sediment associated with sheet pile installation is expected to be relatively minor because of the relatively small area (480 linear feet) of habitat to be disturbed at the upper edge of the intertidal zone, and the fact that the base of the existing seawall where the new sheet pile would be installed is primarily rock and sand substrate. The increase in suspended

sediment is expected to last only a short period of time and be localized to the immediate area, further dissipating with wave and tidal water movement. A turbidity curtain would be used as part of the sheet pile installation, to separate the construction zone from the open waters of the bay and prevent aquatic life from entering the construction zone. Increased suspended sediment may occur immediately after silt curtain removal but is expected to last for no more than a few hours and would quickly dissipate to background levels. Any modification to existing habitat conditions would be considered potentially significant without mitigation. Based on the above analysis, the anticipated effects of elevated suspended sediment levels in the water column resulting from construction activities are expected to be less than significant for listed salmonids and green sturgeon, assuming adequate controls and construction restrictions are implemented as called for below in Mitigation Measures BIO-1a through BIO-1c.

Potential for Elevated Underwater Sound Levels

Elevated underwater sound levels resulting from driving sheet piles with a vibratory or impact[7] hammer may affect listed salmonids, green sturgeon, and longfin smelt during construction if they are present in the nearby waters. However, based on results of hydroacoustic monitoring at various pile driving projects (Buehler et al. 2015), vibratory hammers to be used as part of the sheet pile installation for the proposed project generate lower sound levels and different sound wave forms that do not cause physical injury or mortality to fish. Sheet piles would be driven at low tide when the gravel and sand substrate at the base of the existing seawall is exposed, which would limit the propagation of elevated underwater sound levels in the adjacent water column. In addition, the brief duration of sheet pile driving and shallow water depths would further limit underwater sound resulting from the project. If listed species are present and react behaviorally to the sound produced by construction activities, they would likely vacate the vicinity of construction. Adequate water depths and habitat exists elsewhere throughout Belvedere Cove and adjacent San Francisco Bay to provide sufficient area for these individuals to disperse and forage. Any modification to existing habitat conditions would be considered potentially significant without mitigation. Based on the above analysis, the effects of elevated underwater sound levels during sheet pile driving are anticipated to be less than significant for listed salmonids and green sturgeon, assuming adequate controls and construction restrictions are implemented as called for below in Mitigation Measures BIO-1a through BIO-1c.

Potential for Take of Fish Species

Proposed project activities within the tidal waters of Belvedere Cove would occur within designated critical habitat for Central California Coast steelhead, Sacramento River winter-run Chinook salmon, and the southern DPS for green sturgeon. A temporary reduction in the foraging area of designated critical habitat for these species would occur from benthic (bottom) disturbance resulting from the installation of proposed sheet piles, temporary construction controls, and construction worker activities on the substrate at the existing seawall footing, and possibly other disturbance required as part of compensatory mitigation by regulatory agencies. The temporary reduction in foraging area would be limited to the immediate area directly adjacent to (within about 10 feet of) the 480-foot-long wall repair where construction would occur. Once construction restrictions are removed following completion of construction, however, the benthic substrate of the

[7] Impact pile drivers are expected to be used in only very small portions of the site where underlying conditions warrant their use (refer to more detailed discussion in *Section 4.11, Noise*).

construction zone outside the new sheet pile system would quickly be restored through wave action and tidal flux.

Post-construction, the project would expand the footprint of the existing seawall along Beach Road by approximately 1,200 square feet by extending the sheet pile structure about 2.5 feet outward into the bay for a linear distance of approximately 480 linear feet, potentially reducing foraging and refuge habitat availability for listed salmonids and green sturgeon. Benthic invertebrate survey data are not available for the site, but the habitat at the base of the existing seawall has been degraded by the original installation of the existing seawall as well as construction during the 2019 emergency repair work along about 200 linear feet of the structure. However, the project footprint is not expected to provide significant foraging or refuge opportunities for listed fish species. Nearshore habitats at the base of traditional seawalls, including the existing seawall along Beach Road, generally lack structural complexity. Due to the location along a narrow strip along the base of the existing wall, the proposed sheet pile repair is not expected to significantly reduce foraging or refuge availability for listed salmonids and green sturgeon, or their designated critical habitat areas.

Because regulated waters known to support listed special-status species would be affected by the proposed project, authorizations would be required from regulatory agencies. These authorizations would include a Section 404 authorization from the Corps, which would require consultation with the USFWS and NMFS, a Section 401 Certification from the RWQCB, and possibly an incidental take permit from the CDFW as required under Section 2081 of the California Fish and Game Code. These authorizations would likely require some form of compensatory mitigation for the proposed fill of an estimated 1,200 square feet of tidelands designated as critical habitat for steelhead, Chinook salmon, and green sturgeon. These regulatory agency authorizations would contain additional Avoidance and Minimization Measures (AMM) that would be implemented as part of project construction, in addition to any compensatory mitigation. The 2019 emergency repairs to a portion of the existing seawall, which involved fill to an area that was about half that currently proposed, also required compensatory mitigation. These AMMs would have to be implemented as part of the project and would further reinforce the measures undertaken to minimize adverse effects and provide adequate mitigation as called for in Mitigation Measures BIO-1a through BIO-1c below.

> *Mitigation Measure BIO-1a: Appropriate construction controls and restrictions shall be taken to prevent inadvertent loss of special-status fish species and other aquatic life as a result of construction activities within or near areas of tidal influence and open water habitat of San Francisco Bay to avoid possible inadvertent take of Central California Coastal steelhead, green sturgeon, Central Valley spring-run chinook salmon, and longfin smelt, if present in the area during the time of construction. This shall be accomplished through implementation of the following provisions:*
>
> - *Adequate measures shall be taken to minimize disturbance and sedimentation in aquatic habitat of the bay and Belvedere Lagoon. These measures shall include installing turbidity curtains around in-water construction zones, restricting in-water operations to low tide periods, lowering surface water elevations in the Belvedere Lagoon during sheet pile installation, and timing restrictions for in-water construction, among other possible controls and restrictions.*

- *Preconstruction clearance surveys shall be conducted by a qualified biologist for any in-water construction as called for in Mitigation Measure BIO-1b.*
- *Any pumping as part of dewatering construction areas shall be adequately screened according to the latest screening guidelines of the California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS) to prevent entrainment of special-status fish and other aquatic life during the pumping operation.*
- *Any in-water construction activities shall be restricted to the period from June 1 through October 31, when stray or dispersing special-status fish species would most likely not be expected within the affected areas.*
- *All construction work within regulated waters shall be restricted to daylight hours to avoid disturbing aquatic habitat with artificial light source that could attract fish and other wildlife into the construction zone.*

Mitigation Measure BIO-1b: Prior to initiation of grading or vegetation removal, a qualified biologist shall be retained to train workers on the regulations related to jurisdictional waters, special-status species, and the possible risk of inadvertent take in advance of construction. The qualified biologist shall be someone knowledgeable about the biology and regulations regarding jurisdictional waters, as well as protected species known or with the potential to occur in or adjacent to the project site, including steelhead, Chinook salmon, green sturgeon, and longfin smelt. The following provisions shall apply:

- *The qualified biologist shall oversee installation of turbidity curtains, conduct preconstruction surveys for nesting birds as required in Mitigation Measure BIO-2, and inspect the construction zone in tidal areas, as necessary.*
- *The worker training shall be conducted prior to starting work on the project and upon the arrival of any new worker into the tidal zone. The training program shall include a description of protected species and their habitat needs, any known occurrences in the site vicinity, an explanation of the status of these species and their protection under state and federal legislation, a description of regulated waters and the need to follow all regulatory authorizations, a list of measures being taken to avoid and minimize impacts to protected species during the work, and procedures to follow if a protected species is discovered to be present in the work area.*
- *Fact sheets containing the information presented during the worker training program shall be provided to the Project Foreman and kept on-site for the duration of construction.*
- *The qualified biologist shall train the Project Foreman to serve as an Environmental Monitor who will make sure workers are following all required controls, inspect the construction zone and condition of turbidity curtains to confirm they are functioning, and check for any signs of protected species.*
- *A record of all personnel trained during the project shall be maintained for compliance verification.*

Mitigation Measure BIO-1c: The City of Belvedere shall obtain all necessary authorizations from the CDFW, NMFS, and USFWS as required by federal and state law for potential harm

to special-status fish species. Such authorization would be obtained through interagency coordination in accordance with the U.S. Army Corps of Engineers Section 404 consultation and the CDFW Section 2081 Incidental Take Permit process. The project shall adhere to any additional conditions and restrictions required as part of the authorizations from regulatory agencies. This shall include any required compensatory mitigation for the permanent loss of an estimated 1,200 square feet (0.03 acre) of benthic habitat at the base of the existing seawall, provided at a minimum 1:1 ratio or as negotiated with the regulatory agencies.

The combination of the above measures would reduce this potential impact to less than significant. (LTS)

Impact BIO-2: Project implementation may result in adverse impacts on nesting birds, if present in the site vicinity during construction. (PS)

No special-status terrestrial plant or animal species are suspected to occur in the developed areas of the site, and no significant adverse effects on special-status bat species are anticipated, since no suitable roosting habitat or signs of bat occupation were observed during the field reconnaissance surveys in 2021 and 2022. However, there remains a potential for new bird nests that could be inadvertently destroyed or abandoned during project construction.

The mature trees, landscaping, and even the exterior of the nearby buildings could be used for nesting by birds, including raptors and more common species. Any birds nesting along the San Rafael Avenue or Beach Road segments of the project would likely be acclimated to human disturbance, but jackhammering, pile driving, and other construction-related disturbance would introduce new levels of noise and vibration that could be disruptive to nesting. The MBTA prohibits killing, possessing, or trading in migratory birds, except with a valid permit in accordance with regulations prescribed by the U.S. Secretary of the Interior. This prohibition includes whole birds, parts of birds, and bird nests and eggs. Construction equipment operation in the immediate vicinity of trees and structures during the breeding season could result in the incidental loss of fertile eggs or nestlings or nest abandonment. This would be considered a potentially significant impact.

A standard method to address the potential for nesting birds is either to initiate construction during the non-nesting season, which in Marin County is typically from September 1 to January 31, or to conduct a nesting survey within 14 days prior to initiating construction to determine whether any active nests are present that must be protected until any young have fledged and are no longer dependent on the nest. Protection of the nests, if present, would require that construction setbacks be provided during the nesting and fledging period, with the setback depending on the type of bird species, degree to which the individuals have already acclimated to other ongoing disturbance, and other factors. Without these controls, the project would have a potentially significant impact on nesting birds.

Mitigation Measure BIO-2: Adequate measures shall be taken to avoid inadvertent take of raptor nests and other nesting birds protected under the Migratory Bird Treaty Act and California Fish and Game Code when nests are in active use. This shall be accomplished by taking the following steps:

- *If construction is proposed during the nesting season (February through August), a focused survey for nesting raptors and other migratory birds shall be conducted by a*

qualified biologist within 14 days prior to the onset of vegetation removal or construction, in order to identify any active nests on the project site and in the vicinity of proposed construction.

- *If no active nests are identified during the survey period, or if development is initiated during the non-breeding season (September through January), construction may proceed with no restrictions.*
- *If active nests are found, an adequate setback shall be established around the nest location and construction activities restricted within this no-disturbance zone until the qualified biologist has confirmed that any young birds have fledged and are able to function outside the nest location. Required setback distances for the no-disturbance zone shall be based on input received from the California Department of Fish and Wildlife (CDFW) and may vary depending on species and sensitivity to disturbance. The no-disturbance zone shall be fenced with temporary orange construction fencing or other conspicuous demarcation such as signage and flagging if construction is to be initiated on the remainder of the development site.*
- *A report of findings shall be prepared by the qualified biologist and submitted to the City of Belvedere for review and approval prior to initiation of construction within the no-disturbance zone during the nesting season (February through August). The report shall either confirm absence of any active nests or confirm that any young birds have fledged within a designated no-disturbance zone and construction can proceed.*

The combination of the above measures would reduce this potential impact to less than significant. (LTS)

Impact BIO-3: Proposed construction would require modifications within regulated waters. (PS)

The preliminary wetland assessment conducted during the field reconnaissance surveys in 2021 and 2022 determined that wetlands are absent from the project site, but that jurisdictional waters include the unvegetated upper limits to the tidal zones to Richardson Bay and Belvedere Cove and the unvegetated waters of the Belvedere Lagoon, which are connected by culverts to Richardson Bay under San Rafael Avenue. The proposed project would include installation of approximately 145 linear feet of sheet pile at the northwestern edge of the Belvedere Lagoon to reinforce the existing levee along San Rafael Avenue, and installation of approximately 480 linear feet of sheet pile and concrete backfill at the base of the existing seawall to the east of Beach Road within the intertidal zone.

As discussed above under Impact BIO-1, measures would be taken as part of construction to minimize disturbance to aquatic habitat and ensure avoidance of special-status aquatic species. Preconstruction surveys would be conducted to ensure project construction activities do not disrupt bird nesting, and controls would be installed to separate work in aquatic habitat from surrounding waters. These controls would include using turbidity curtains, lowering the surface water elevation of the Belvedere Lagoon during sheet pile installation, restricting the timing of work in aquatic habitat to daylight hours and outside the migratory period for special-status fish species, and timing initial construction work associated with sheet pile installation along Beach Road to occur during low tide when bay waters have receded and the base of the existing seawall is completely exposed.

The proposed sheet pile systems would disturb regulated waters during installation. Potential impacts within the highly maintained waters of the Belvedere Lagoon would be short-term and relatively minor, with the sheet piles installed at or below the existing bottom elevation and turbidity curtains limiting the potential for significant displacement of silt during installation. For example, if the turbidity curtain were installed about 50 feet east of the western shoreline to the lagoon, an estimated 7,500 square feet of the aquatic habitat within the lagoon would be temporarily disturbed during construction. As discussed under Impact BIO-1, no special-status fish or other species are believed to be present in the waters of the Belvedere Lagoon because of its hydrologic isolation from Richardson Bay, poor water quality, and managed condition. No long-term impacts on the waters associated with the Belvedere Lagoon are anticipated as the sheet piles would be installed at or below existing grade, and no additional controls are considered necessary.

The sheet pile installation within tidal waters at the base of the existing seawall east of Beach Road would be accomplished using careful controls to minimize disturbance to regulated aquatic habitat but would result in temporary impacts during installation and permanent impacts associated with the sheet pile system and concrete cap installed between the exposed end of the sheet pile and the base of the existing seawall. A temporary work zone would be established at low tide when the base of the existing seawall is completely exposed. Turbidity curtains and other containment measures required as part of regulatory agency authorizations would be installed when water is absent. This temporary work zone would be about 10 feet wide along the 480 linear feet of sheet pile to be installed within the tidal zone. The completed sheet pile installation along the base of the existing seawall would permanently affect an estimated 1,200 square feet of regulated waters, with the top of the sheet pile and concrete cap extending a couple of feet above existing grade an average distance of about 2.5 feet bayward from the existing seawall. The temporary construction zone would extend an average of 7.5 feet bayward of the sheet pile footprint, temporarily disturbing an additional 3,600 square feet of intertidal zone. This effect would likely be temporary, however, with conditions quickly restored as gravel and sand along this zone are routinely moved through tidal action.

Modifications to regulated waters would require appropriate authorizations from state and federal regulatory agencies, including the Corps and RWQCB under Sections 404 and 401 of the CWA. Representatives of the CDFW have indicated that a Streambed Alteration Agreement is not required because the project's impacts would occur within the tidal zone. Further review would be provided by the Corps and RWQCB when a permit application is formally submitted for authorization of activities within jurisdictional limits. This review would include consultation with the USFWS and NMFS as part of the Section 7 consultation conducted by the Corps. Based on the requirements associated with the 2019 emergency repairs to the existing seawall along the east side of Beach Road, it is likely that a compensatory mitigation program would be required as part of the regulatory agency authorizations for at minimum the estimated 1,200 square feet of permanent impacts within the intertidal zone. This work could include removal of additional abandoned pilings and other debris in the tidal zone, as was required as part of the 2019 emergency repair authorization. If new habitat is created as part of any compensatory mitigation, a program to monitor and maintain any created habitat provided as mitigation would be a requirement of the regulatory agency authorizations, ensuring adequate compensatory mitigation and successful establishment. As discussed in *Section 4.9, Hydrology and Water Quality,* of this EIR, best management practices (BMPs) would be used to prevent any construction-generated sediments or pollutants from entering the surrounding wetlands and open water habitat. The BMPs would

include controls to isolate the construction zone where disturbance within aquatic habitat is required.

While the proposed project would only affect relatively small areas of regulated waters, with an estimated 1,200 square feet (0.03 acre) of permanently impacted waters and 11,100 square feet (0.25 acre) of temporary impacts, potential impacts on regulated waters would be significant.

> *Mitigation Measure BIO-3: A compensatory mitigation program shall be developed and implemented to provide adequate mitigation for jurisdictional waters affected by proposed improvements. A jurisdictional wetland delineation shall be prepared by a qualified wetland specialist and submitted for verification by the U.S. Army Corps of Engineers (Corps). A Regulated Waters Protection and Replacement Program (RWPRP) shall be prepared by the qualified wetland specialist and implemented to provide compensatory mitigation where jurisdictional waters are affected, shall minimize disturbance to unvegetated waters, and shall be reviewed and approved by regulatory agencies. The RWPRP shall contain the following components:*
>
> - *The RWPRP shall include appropriate implementation measures to prevent inadvertent loss and degradation of jurisdictional waters to be protected and shall provide for replacement of the estimated 1,200 square feet (0.03 acre) of regulated waters eliminated by sheet pile construction at a minimum 1:1 replacement ratio.*
> - *Where verified waters of the U.S. are present and cannot be avoided, authorization for modifications to these features shall be obtained from regulatory agencies with jurisdiction. These agencies include the Corps under Section 404 permitting process where waters of the United States are affected by the project and the Regional Water Quality Control Board (RWQCB) as part of the Section 401 Certification process. All conditions required as part of the authorizations by the Corps and RWQCB shall be implemented as part of the project.*
> - *Consultation or incidental take permits may be required under the California Endangered Species Act and Federal Endangered Species Act. The City of Belvedere shall obtain all legally required permits or other authorizations from the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and California Department of Fish and Wildlife (CDFW) under the Endangered Species Acts.*
> - *Temporary fencing or another system shall be installed to demarcate the limits of proposed construction in jurisdictional waters. The turbidity curtain may serve as the temporary construction containment fencing.*
> - *Grading, construction, and restoration work within the jurisdictional waters shall be conducted in a way that avoids or minimizes disturbance of existing aquatic habitat as called for in Mitigation Measure BIO-1a.*
>
> *The combination of the above measures would reduce this potential impact to less than significant. (LTS)*

Cumulative Impacts

The analysis of potential cumulative impacts on biological resources considered anticipated development in the surrounding area, including the pending or approved developments shown in

Figure 6-1 in *Chapter 6, Other CEQA Considerations*, of this EIR. In Belvedere, approved or currently pending development includes (1) the Flood Barrier Project, which would provide for flood barrier improvements on the project site; and (2) the Mallard Pointe Project, which would replace 22 existing housing units with 42 new units, for a net increase of 20 housing units (see Figure 6-1 in *Chapter 6, Other CEQA Considerations*, of this EIR).

The potential impacts of development on biological resources tend to be site-specific, and the overall cumulative effect would be dependent on the degree to which significant vegetation and wildlife resources are protected on a particular site. Such protection includes preservation of well-developed native vegetation (native grasslands, oak woodlands, riparian woodland, coastal salt marsh, etc.), populations of special-status plant or animal species, and wetland features (including freshwater marsh and seeps, brackish water marsh, and riparian corridors and drainages). Potential impacts on sensitive biological resources, including jurisdictional waters and essential habitat for special-status species, would require adequate compensatory mitigation. Environmental review of specific development, including development of the remaining undeveloped or redeveloped lands in the Belvedere vicinity, would serve to ensure that important biological resources are identified, protected, and properly managed, and to prevent any significant adverse development-related impacts. These environmental review requirements would apply to the Mallard Pointe Project and the Flood Barrier Project.

To some degree, cumulative development contributes to an incremental reduction in the amount of existing wildlife habitat, particularly for birds and larger mammals. Habitat for species intolerant of human disturbance can be lost as development encroaches into previously undeveloped areas, disrupting or eliminating movement corridors and fragmenting the remaining suitable habitat retained within parks, private open space, or undeveloped properties. New development in the Belvedere vicinity could result in further conversion of existing natural habitats to urban and suburban conditions, limiting the existing habitat values of the surrounding area. These changes could include further loss of wetlands and sensitive natural communities, reduction in essential habitat for special-status species, and removal of mature native trees and other important wildlife habitat features. Additional development may contribute to degradation of the remaining aquatic habitat associated with creeks and open waters of San Francisco Bay if adequate protective measures are not implemented. Grading associated with construction activities generally increases erosion and sedimentation, and urban pollutants from new development could reduce water quality. However, other development would similarly be subject to regulatory controls on erosion and sedimentation after grading, and compliance with numerous water quality regulations. Compliance with this comprehensive regulatory oversight would minimize the potential for water quality degradation for cumulative development.

No cumulatively considerable impacts on biological resources are expected as a result of anticipated construction associated with the proposed project. The site is largely developed with urban uses, with only limited biological resource value for terrestrial species habitat. Compliance with Mitigation Measures BIO-1a, BIO-1b, BIO-1c, BIO-2, and BIO-3 would serve to address potential impacts on aquatic habitat, special-status fish, and nesting birds. Compensatory mitigation would serve to address the estimated 1,200 square feet of permanent impacts on regulated waters associated with the proposed project, and replacement landscaping would serve to replace any trees and other vegetation removed to accommodate project improvements. Thus, the proposed project would not contribute to significant cumulative impacts on biological resources, and no mitigation measures for cumulative impacts would be necessary.

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4.4 CULTURAL RESOURCES

INTRODUCTION

This section of the Draft Environmental Impact Report (EIR) describes the affected environment and regulatory setting and considers and evaluates the potential impacts of the Belvedere Seismic Upgrade Project (BSUP or project) on cultural resources in the project area.

Cultural resources include prehistoric archaeological sites, historic archaeological sites, and historic structures, and generally consist of artifacts, food waste, structures, and facilities made by people in the past. Prehistoric archaeological sites are places that contain the material remains of activities carried out by the native population of the area (Native Americans) prior to the arrival of Europeans in southern California. Artifacts found in prehistoric sites include flaked stone tools such as projectile points, knives, scrapers, drills, and the resulting waste flakes from tool production; ground stone tools such as manos, metates, mortars, pestles for grinding seeds and nuts; bone tools such as awls, ceramic vessels or fragments; and shell or stone beads. Prehistoric features include hearths or rock rings, bedrock mortars and milling slicks, rock shelters, rock art, and burials.

Additionally, resources that are sacred, spiritual, or religious and are of particular importance to California Native American tribes are considered tribal cultural resources (TCRs) and are addressed separately in *Section 4.15, Tribal Cultural Resources*, of this EIR. These may or may not share some qualities of prehistoric archaeological sites.

Places that contain the material remains of activities carried out by people during the period when written records were produced after the arrival of Europeans are considered historic archaeological sites. Historic archaeological material usually consists of domestic refuse such as bottles, cans, ceramics, and food waste, disposed of either as roadside dumps or near structure foundations. Archaeological investigations of historic-period sites are usually supplemented by historical research using written records.

Historic structures include houses, garages, barns, commercial structures, industrial facilities, community buildings, and other structures and facilities that are more than 50 years old. Historic structures may also have associated archaeological deposits, such as abandoned wells, cellars, and privies, refuse deposits, and foundations of former outbuildings.

ECORP Consulting, Inc. conducted a cultural resources inventory and evaluation for the BSUP (ECORP, 2022) to meet the requirements of Section 106 of the National Historic Preservation Act (NHPA) and the California Environmental Quality Act (CEQA). The purpose of the report was to document the results of the literature review, archival research, and pedestrian survey required to identify potentially eligible cultural resources, historic buildings, structures, and objects that could be affected by the proposed project. The study also included an impact assessment of the China Cabin (P-21-1055).

Sections 6253, 6254, and 6254.10 of the California Government Code authorize state agencies to exclude archaeological site information from public disclosure under the Public Records Act. In addition, the California Public Records Act (Government Code Section 6250 et seq.) and California's open meeting laws (The Brown Act, Government Code Section 54950 et seq.) protect the confidentiality of Native American cultural place information. Under Exemption 3 of the federal Freedom of Information Act (5 USC 5), because the disclosure of cultural resources location information is prohibited by the Archaeological Resources Protection Act of 1979 (16 United States Code [USC] 470hh) and Section 304 of the NHPA, this information is also exempted from disclosure under the Freedom of Information Act. Likewise, the Information Centers of the California Historical Resources Information System maintained by the Office of Historic Preservation (OHP) prohibit public dissemination of records search information. In compliance with these requirements, the results of this cultural resource investigation were prepared as a confidential document, which is not intended for public distribution in either paper or electronic format. A copy of the technical information cited above is on file with the City of Belvedere and available for review by qualified cultural resources professionals.

ENVIRONMENTAL SETTING

Prehistory

It is generally believed that human occupation of California began at least 10,000 years before present (BP). The archaeological record indicates that between approximately 10,000 and 8,000 BP, a predominantly hunting economy existed, characterized by archaeological sites containing numerous projectile points and butchered large animal bones. Animals that were hunted probably consisted mostly of large species still alive today. Bones of extinct species have been found but cannot definitively be associated with human artifacts. Although small animal bones and plant grinding tools are rarely found within archaeological sites of this period, small game and floral foods were probably exploited on a limited basis. A lack of deep cultural deposits from this period suggests that groups included only small numbers of individuals who did not often stay in one place for extended periods (Wallace, 1978).

Around 8,000 BP, there was a shift in focus from hunting toward a greater reliance on plant resources. Archaeological evidence of this trend consists of a much greater number of milling tools (e.g., metates and manos) for processing seeds and other vegetable matter. This period, which extended until around 5,000 BP, is sometimes referred to as the Millingstone Horizon (Wallace, 1978). Projectile points are found in archaeological sites from this period, but they are far fewer in number than from sites dating to 8,000 BP. An increase in the size of groups and the stability of settlements is indicated by deep, extensive middens at some sites from this period (Wallace, 1978).

The San Francisco Bay area has always been an attractive environment for human occupation, including in ancient times, as evidenced by the historically known Native American groups reported to have been living in the area by early European settlers. The tribe inhabiting all of Marin County and the adjoining portions of Sonoma County was the Coast Miwok, while various Costanoan groups occupied the San Francisco peninsula, the South Bay, and shoreline of the East Bay. The Bay and Plains Miwok occupied the area around Mt. Diablo as well as the lands to the north and east (Milliken et al., 2007:100). Lands to the northeast of the Coast Miwok contained the territory of the Wappo and Patwin.

The Coast Miwok were within a territory that was separated from the other Miwok groups that occupied the San Joaquin Valley and the south shore of Suisun Bay. The language of the Miwok is similar to the Wintun, Patwin, Yokut, Maidu, and Costanoan languages as they are all part of the broader Penutian language family. Based on linguistic evidence, the Miwok-Costanoan sub-branch arrived in the San Francisco area approximately 4,000 years ago and they pushed the Hokan-speaking inhabitants out of the area. These earlier people were possibly related to the Wappo or Pomo. The Berkeley Pattern archaeological assemblage is evident around the same time (Moratto, 1984) and it is representative of potential co-mingling of the Hokan and Utian cultural elements (Milliken et al., 2007).

Eventually, a dialectic division formed among the Coast Miwok forming the Southern Marin (*Hookooeko*) and the Western-Bodgega Miwok (*Olamentko*) groups (Kelly, 1978:414). A third group, the *Lekahtewutko* tribe, occupied the northern portion of the Southern Marin Valley (Merriam, 1907), while Milliken identified the *Aguasto* tribe having occupied the area of Point San Pedro and San Rafael (Milliken et al., 2007), and the *Huimen* tribe lived in the modern-day communities of Sausalito, Mill Valley, Tiburon, and Belvedere (Goerke, 2007:100).

The Coast Miwok used hunting and gathering for their subsistence strategies as they were able to take advantage of both terrestrial and marine resources. They used up to seven species of acorns for their main vegetable staple, supplemented with kelp, seaweed, and other nuts, berries, and seeds. Meat resources included big game animals like black-tailed deer and Tule elk, as well as other mammals and birds. The ocean provided shellfish (e.g., abalone), marine mammals, and fish. The shellfish provided currency, decoration, and exchange currency for other tribes. Obsidian was their most desired tool material; the only source within Marin County comes from Burdell Mountain, and the obsidian is not of high quality and is not detected in archaeological collections (Jackson, 1989:82). The obsidian most often encountered comes from Annadel and Napa Valley sources (Roop and Evans, 2009:6).

Ethnography

More recently, and ethnographically, the project area is in the southern portion of the territory occupied by the Penutian-speaking Coast Miwok. Coast Miwok territory stretched from Duncan's Point in the north to Sausalito in the south and from Sonoma in the east to the Pacific Ocean (Kelly, 1978). The Coast Miwok language is considered one of the California Penutian languages. Several places in the area derive their names from Coast Miwok language. For example, Cotati, meaning "to punch," and Tamalpais, or "coast hill," both come from the Coast Miwok language.

Coast Miwok lived in permanent, often large villages. Typical Coast Miwok houses were conical structures with grass covering a framework of interlocking poles. Larger villages contained sweathouses, which served as a center for social and religious activities. The Coast Miwok had a highly developed monetary system based on clam shell beads and had strong property systems in place. Large villages had a non-hereditary Chief whose job was to oversee the village and give daily speeches to residents. There were also two important female figures in the village; the Woman Chief was involved in religious ceremonies and cultural activities, and the second figure, the Maien, organized the construction of the ceremonial house and the preparation of festivals (Kelly, 1978).

Subsistence of the Coast Miwok consisted of a wide variety of plants, seafood, and game found near the sea as well as inland. Due to the Miwok's diversified terrain, they were well-rounded in

game hunting, fishing, and foraging, adapting to what was plentiful at different times of the year. During the winter months there was a heavy reliance on geese and dried stored foods such as acorns, kelp, and seeds. Salmon running in the winter were also caught using circular dip nets, weirs, and spears. During the summer, larger game such as deer, bear and elk were hunted in the hills. Summer also gave way to plant gathering, which was used to offset the winter months when large game was scarce (Kelly, 1978).

The Coast Miwok population, according to Kroeber (1925), has always been small, at an average of 1,500 during aboriginal times. By 1851, however, their population had plummeted to about 250, and by 1920 it was down to five. The drastic population decrease coincided with the decreases in all California Indian populations during early Euro-American incursion.

Today, there exist remains of several hundred Coast Miwok sites located throughout Marin and southern Sonoma County, most of which have been identified through archaeological surveys. The material remains at a site are instructive as to the types of activities carried out there. Long-term habitation sites found throughout most of this area are marked by the presence of well-developed midden deposits, which are unusual soils that have resulted from the long-term buildup of organic materials and prehistoric human activity. In Belvedere, there are several recorded prehistoric sites. Prehistoric sites can yield a variety of information about the early peoples of the region. Such sites may include locations of cultural, social, or economic importance and may also have spiritual significance to the ancestors of these peoples or to living Native Americans. Archaeological discoveries in Belvedere are remarkable for the great quantities of traded and local items, such as large caches of abalone beads, pendants, and ceremonial objects. They are also remarkable for the information they provide about what transpired in Belvedere long ago. Recent construction has uncovered archaeological sites that dated to 39 A.D. Investigations of the sites and salvage recovery have resulted in the discovery of hundreds of significant artifacts, including dozens of human burials, some appearing to be of high-status individuals, as well as hearths, cooking features, ash lenses, and other artifact concentrations. Archaeological research estimates that some of the artifacts and burials are more than 1,000 years old (City of Belvedere, 2010).

Project Area History

The project area is within the Rancho Corte Madera del Presidio Land Grant, which was granted by Governor Jose Figueroa to John Thomas Reed in 1834. Reed was an Irish sailor who arrived at the bay around 1826 (Kyle, 2002). The land grant lies on the peninsula, including Belvedere and Corinthian Islands, located northwest of Raccoon Strait, which is northwest of Angel Island. The rancho extended inland between the Punta de Quentin and Saucelito (also called Sausalito) ranchos. In the mid-1830s, Reed built the first sawmill (California Historical Landmark #207) in Marin County that milled cut wood for the San Francisco Presidio. The Rancho Corte Madera del Presidio translated from Spanish means *the wood cutting place for the Presidio*, and is located within present-day Mill Valley. Belvedere and Tiburon coves were originally called Stillwater Bay and were historically used for drying codfish (ARS, 2011). Israel Kashow settled on the island in 1855 and lived in the vicinity of today's San Francisco Yacht Club for 30 years (ARS, 2011). Kashow established a cod fishery along the salt marsh that is now Beach Road. San Rafael Avenue is depicted as a causeway on early maps.

In 1896, Belvedere was incorporated into Marin County as a subdivision for wealthy San Franciscans who wanted weekend country homes (Fanning, 2006). Since many San Francisco

properties were destroyed by the 1906 San Francisco earthquake and fire, Belvedere grew in popularity as many moved there temporarily but stayed permanently. Some residents lived on houseboats called *arks* in Belvedere Cove. These arks had to be moved to the lagoon in winter for protection. The arks inspired the annual water festival known as *Night in Venice*, which began in 1895 and occurred every year until 1927. Residences would decorate their arks and yachts with lanterns to parade around the lagoon (Stafford, 2007). The tradition ended in 1927 due to the pumping of mud from Belvedere and Tiburon coves into the lagoon creating a landfill and later Tiburon Boulevard (Stafford, 2007).

A portion of the Rancho Corte Madera del Presidio Land Grant, today's Mill Valley, was not confirmed by the U.S. Land Commission as Reed's until the 1880s. Reed gave his lawyer, Thomas B. Valentine, two small islands as payment for helping him confirm his land with the U.S. Land Commission. The two islands were Valentine Island, today's Corinthian Island, and Belvedere Island. Valentine sold Belvedere Island to the Belvedere Land Company, which he founded in 1890. A subdivision with a nine-hole golf course was created on the northern end the island. The golf course extended from today's Oak Avenue to the north end of Belvedere. The golf course went bankrupt during the Great Depression and residential development of the former golf course began in the 1930s. Michael M. O'Shaughnessy, the civil engineer who would later design the Hetch Hetchy water system, created the street layout of Belvedere Island and Mill Valley (Cerny, 2007). Pedestrian lanes with stairs were built throughout the island for access to the entire shoreline. The Belvedere Land Company planted over 3,500 eucalyptus and pine trees on the island. Valentine selected the name Belvedere because in Italian it means *beautiful view* (Gudde, 1969). By 1900, the City of Belvedere had 50 homes and one hotel, the Belvedere Hotel. Harry B. Allen, the developer of the Sea Cliff neighborhood of San Francisco, acquired control over the Belvedere Land Company in 1935 (Fanning, 2006).

A drawbridge historically stretched from Corinthian Island to Beach Road, at today's Main Street, which allowed the arks and water to move from Belvedere Cove into the lagoon. Allen began dredging the natural lagoon in 1936. He had a conduit built beneath San Rafael Avenue sometime after World War II, which changed the lagoon's natural inlet to the Richardson Bay side rather than the drawbridge at Belvedere Cove (Cluff, 2018). It was not until 1930 that Tiburon Boulevard was extended from San Rafael Avenue to Tiburon; therefore, San Rafael Avenue to Beach Road was the only overland way to get to Tiburon before the boulevard was constructed (Cluff, 2018). The drawbridge was completely cemented in the late 1930s when a permanent road, Tiburon Boulevard, was built to reach Tiburon. Following the dredging of the lagoon and closing of the drawbridge, the arks could no longer travel from Belvedere Cove into the lagoon. The arks were then put on pilings along the cove and converted into permanent housing. Since at least the 1890s, buildings situated on pilings over Belvedere Cove have stretched the length of Beach Road, which was historically a sand spit and salt marsh. According to aerial photographs, the current extension of Beach Road to Tiburon Boulevard was constructed between 1952 and 1957.

In 1905, architect Albert Farr designed the two-story Belvedere Land Company building, located at 83 Beach Road. He then designed a group of townhouses, known as Farr Cottages, next to the Belvedere Hotel, which would set the standard for design for the City of Belvedere (Fanning, 2006). The Belvedere Hotel was located on Beach Road where today's San Francisco Yacht Club was built. The hotel opened in 1899 and closed in 1924. Three Native American burials were discovered during the construction of the Belvedere Hotel in 1898 (ARS, 2011). The San Francisco Yacht Club demolished the hotel and moved to Belvedere Cove in 1934. After World War II, the

Belvedere Land Company began dredging the existing lagoon to build waterfront homes within the lagoon. The lagoon is approximately 66 acres with an average depth of 4 to 6 feet. By the 1960s, the lagoon development was complete and showcased mid-century homes (Cerny, 2007).

According to the Historic Resources Sensitivity Map for the Belvedere General Plan Update (City of Belvedere, 2010), half of the properties along Beach Road are areas of high sensitivity for historical resources and have structures constructed before 1910. The remaining areas are identified as areas of medium sensitivity with structures constructed between 1910 and 1965, and include an "old dump site."

Existing Conditions

This section contains information about cultural resources within the vicinity of the project area, obtained from the California Historical Resources Information System's Northwest Information Center (NWIC) in Rohnert Park, City of Belvedere files, and a field survey of the area.

Record Search Results

A record search at the NWIC on February 10, 2022, revealed that 39 previous cultural resource investigations have been conducted within 0.5 mile and including the project site, covering approximately 35 percent of the total area surrounding the project site. Of the 39 studies, two included portions of the Area of Potential Effects (APE). The records search also determined that 23 previously recorded pre-contact and historic-era cultural resources are located within 0.5 mile of the project site. Of these, 13 are believed to be associated with Native American occupation of the vicinity, and nine are historic-era buildings. Seven of the 13 previously recorded pre-contact resources have yielded human remains. Only one resource was documented within the proposed construction area, but two other resources are documented near the construction area, and one historic-era structure is adjacent to the construction area.

Field Survey Results

An archaeologist surveyed the project site for cultural resources on February 15 and May 3, 2022. The entire project site was either paved over, built out, or an earthen walking path, or contained ornamental landscaping. The archaeologist inspected the right-of-way along San Rafael Avenue and Beach Road for cultural resources. The proposed project staging areas were entirely paved over or covered in gravel (see Figure 3-10 in *Chapter 3, Project Description*, of this EIR).

The San Rafael Avenue portion consists of an existing earthen walking path overlooking Richardson Bay. The path includes landscaped areas, bark, a decomposed granite path, and a rip-rap embankment, resulting in poor to fair ground visibility. This portion of the project site is mainly located on the bay side of San Rafael Avenue and historic-period residences and modern residences line the east side of the road.

The record search revealed that a portion of a pre-contact cultural resource is mapped within the project site. The specific location is confidential and restricted from public dissemination by state and federal law. The archaeologist did not observe any evidence of the resource within the project site but observed exposed shell on properties near its recorded location. This resource has been previously recommended eligible by Bryne (2008) for the National Register of Historic Places

(NRHP) and California Register of Historical Resources (CRHR). This resource could potentially be a TCR as discussed in *Section 4.15, Tribal Cultural Resources*, of this EIR.

Previous ground disturbance at certain locations within and adjacent to the project site yielded the presence of midden and human remains, which have since been reburied and recorded as a pre-contact resource. This location was entirely paved over during the survey and is located outside the project site. This resource has not been evaluated for eligibility for the NRHP or CRHR; however, the presence of human remains suggests that it would be eligible and therefore a significant historical resource.

The portion of the project site along Beach Road was entirely paved and consists of an existing seawall and sidewalk, yielding zero percent ground visibility. Adjoining the Beach Road portion of the project site and situated over Belvedere Cove are the Belvedere-Tiburon Landmarks China Cabin (P-51-1055), the San Francisco Yacht Club, Farr Cottages, and other residential properties, mostly owned by the Belvedere Land Company. The adjacent properties are on pilings over Belvedere Cove with either an elevated walkway or connection to the sidewalk.

According to the record search, two pre-contact cultural resources are located immediately adjacent to portions of the project site, but no evidence of the resources was observed within the project site. These resources have not been evaluated for eligibility for the NRHP or CRHR; however, the presence of human remains suggests that they would be eligible for listing as a historic resource and therefore a significant historical resource. Additionally, these resources could be considered a TCR as discussed in *Section 4.15, Tribal Cultural Resources*, of this EIR.

The 2022 survey identified two new historic-era cultural resources within the project site: San Rafael Avenue and Beach Road. The two roads historically were causeways located at either end of the lagoon and later were improved with levees and road embankments. The roads were evaluated using NRHP and CRHR criteria and found to be not eligible for either the NRHP or the CRHR. Therefore, the two roads are not historic properties under Section 106 and are not a historical resource under CEQA.

REGULATORY FRAMEWORK

This section describes the federal, state, and local environmental laws and policies relevant to cultural resources.

Federal and State Regulations

National Historic Preservation Act (NHPA)

The federal law that covers cultural resources that could be affected by federal undertakings is the National Historic Preservation Act (NHPA) of 1966, as amended. Section 106 of the NHPA requires that federal agencies consider the effects of a federal undertaking on properties listed in or eligible for the NRHP. The agencies must afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on the undertaking. A federal undertaking is defined in 36 Code of Federal Regulations (CFR) 800.16(y) as follows:

> A federal undertaking means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license, or approval.

The regulations that stipulate the procedures for complying with Section 106 are in 36 CFR 800. The Section 106 regulations require:

- Definition of the APE;
- Identification of cultural resources within the APE;
- Evaluation of the identified resources in the APE using NRHP eligibility criteria;
- Determination of whether the effects of the undertaking or project on eligible resources will be adverse; and
- Agreement on and implementation of efforts to resolve adverse effects, if necessary.

The federal agency must seek comment from the State Historic Preservation Officer (SHPO) and, in some cases, the ACHP, for its determinations of eligibility, effects, and proposed mitigation measures. Section 106 procedures for a specific project can be modified by negotiation of a Memorandum of Agreement or Programmatic Agreement between the federal agency, the SHPO, and, in some cases, the project proponent.

Effects on a cultural resource are potentially adverse if the lead federal agency, with the SHPO's concurrence, determines the resource eligible for the NRHP, making it a "historic property," and if application of the Criteria of Adverse Effects (36 CFR 800.5[a][2] et seq.) results in the conclusion that the effects will be adverse. The NRHP eligibility criteria, contained in 36 CFR 63, are as follows:

> The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess aspects of integrity of location, design, setting, materials, workmanship, feeling, association, and
>
> (A) is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
>
> (B) is associated with the lives of persons important in our past;
>
> (C) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
>
> (D) has yielded, or may be likely to yield, information important in prehistory or history.

In addition, the resource must be at least 50 years old, barring exceptional circumstances (36 CFR 60.4). Resources that are eligible for, or listed on, the NRHP are historic properties.

Regulations implementing Section 106 of the NHPA (36 CFR 800.5) require that the federal agency, in consultation with the SHPO, apply the Criteria of Adverse Effect to historic properties within the APE. According to 36 CFR 800.5(a)(1):

> An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association.

California Environmental Quality Act (CEQA)

CEQA is the state law that applies to a project's impacts on cultural resources. A project is an activity that may cause a direct or indirect physical change in the environment and that is undertaken or funded by a state or local agency, or requires a permit, license, or lease from a state or local agency.

CEQA Requirements for Historical Resources

CEQA requires that impacts on "historical resources" be identified and, if the impacts will be significant, feasible mitigation measures be adopted to reduce the impacts.

A historical resource is a resource that:

- Is listed in or has been determined eligible for listing in the California Register of Historical Resources (CRHR) by the State Historical Resources Commission, or has been determined historically significant by the CEQA lead agency because it meets the eligibility criteria for the CRHR;
- Is included in a local register of historical resources, as defined in Public Resources Code (PRC) 5020.1(k), or
- Has been identified as significant in a historical resources survey, as defined in PRC 5024.1(g) (California Code of Regulations [CCR] Title 14, Section 15064.5(a)).

The eligibility criteria for the CRHR indicate that a resource is eligible for listing in the CRHR if (CCR Title 14, Section 4852(b)):

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the U.S.;
2. It is associated with the lives of persons important to local, California, or national history;
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition, the resource must retain integrity, which is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association (CCR Title 14, Section 4852(c)). Resources that have been determined eligible for the NRHP are automatically eligible for the CRHR.

Impacts on a historical resource, as defined by CEQA (i.e., a resource listed in an official historic inventory or survey or eligible for the CRHR), are significant if the resource is demolished or destroyed or if the characteristics that made the resource eligible are materially impaired (CCR

Title 14, Section 15064.5(b)). Demolition or alteration of eligible buildings, structures, and features such that they would no longer be eligible would result in a significant impact. Whole or partial destruction of eligible archaeological sites would result in a significant impact. In addition to impacts from construction resulting in destruction or physical alteration of an eligible resource, impacts on the integrity of setting of physical features (sometimes termed visual impacts) in the project area could also result in significant impacts.

CEQA Requirements for Unique Archaeological Resources

CEQA also requires lead agencies to determine if a proposed project would have a significant effect on unique archaeological resources. If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC Section 21084.1 and CEQA Guidelines Section 15064.5 would apply. If an archaeological site does not meet the CEQA Guidelines criteria for a historical resource, 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:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information;
- Has a special and particular quality such as being the oldest of its type or the best available example of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

CEQA Requirements for Treatment of Resources

The 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 (14 CCR Section 15064[c][4]).

If the project would result in a significant impact on a historical resource or unique archaeological resource, treatment options under PRC Section 21083.2 include activities that preserve such resources in place in an undisturbed state. Other acceptable methods of mitigation under Section 21083.2 include excavation and curation or study in place without excavation and curation (if the study finds that the artifacts would not meet one or more of the criteria for defining a unique archaeological resource).

Section 7050.5(b) of the California Health and Safety Code specifies protocol when human remains are discovered, as follows:

> In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined, in accordance with Chapter 10 (commencing with Section 27460) of Part 3 of Division 2 of Title 3 of the Government Code, that the remains are not subject to the provisions of Section 27492 of the Government Code or any other related provisions of law concerning investigation of the

> circumstances, manner and cause of death, and the recommendations concerning treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in Section 5097.98 of the Public Resources Code.

CEQA Guidelines Section 15064.5(e) requires that excavation activities stop whenever human remains are uncovered and that the county coroner be called in to assess the remains. If the county coroner determines that the remains are those of Native Americans, the Native American Heritage Commission (NAHC) must be contacted within 24 hours. At that time, the lead agency must consult with the appropriate Native Americans, if any, as identified by the NAHC. Section 15064.5 directs the lead agency (or applicant), under certain circumstances, to develop an agreement with the Native Americans for the treatment and disposition of the remains.

In addition to the mitigation provisions pertaining to accidental discovery of human remains, the CEQA Guidelines also require that a lead agency make provisions for the accidental discovery of historical or archaeological resources, generally. Pursuant to Section 15064.5(f), these provisions should include "an immediate evaluation of the find by a qualified archaeologist. If the find is determined to be an historical or unique archaeological resource, contingency funding and a time allotment sufficient to allow for implementation of avoidance measures or appropriate mitigation should be available. Work could continue on other parts of the building site while historical or unique archaeological resource mitigation takes place."

CEQA Requirements for Tribal Cultural Resources (TCRs)

TCRs are defined in Section 21074 of the California PRC as sites, features, places, cultural landscapes (geographically defined in terms of the size and scope), sacred places, and objects with cultural value to a California Native American tribe. A consideration of impacts on TCRs is addressed separately in *Section 4.15, Tribal Cultural Resources,* of this EIR.

Local Regulations and Policies

Belvedere Municipal Code

Title 21 (Historic Preservation) of the Belvedere Municipal Code provides as follows:

> 21.04.010 Findings. The City Council finds that the Legislature of the State of California has recognized the value of protecting and preserving sites and structures of historic, aesthetic and architectural importance and has empowered cities to adopt regulations and incentives to achieve those aims. The City Council further finds that the people of the City and the public generally will be well served by the protection and preservation of such significant sites and structures, which impart a distinct aspect to the City and which serve as visible reminders of the historical heritage of the City or the State. (Ord. 93-5 § 1 (part), 1993)
>
> 21.04.020 Purposes. The purposes of this Title are:
>
> A. To maintain and contribute to the character of Belvedere by protecting, enhancing and perpetuating sites and structures having special historical, aesthetic and architectural value;

B. To allow changes to such significant sites and structures while ensuring that such changes are made with sensitivity to the significant features of the site or structure;

C. To serve as a reminder of the historical background of the City;

D. To give owners of designated properties the ability to take advantage of laws pertaining to sites and structures having special historic, architectural and aesthetic value;

E. To provide the Planning Commission and the City Council with objective criteria and specific information for use in making decisions concerning sites and structures having special historic, architectural and aesthetic value;

F. To help prevent the inadvertent loss or inappropriate alteration of sites or structures having special historic, architectural and aesthetic value resulting from the absence of this Title. (Ord. 2006-6 § 1 (part); Ord. 93-5 § 1 (part), 1993)

City of Belvedere General Plan

The City's General Plan (City of Belvedere, 2010) includes the following goals, policies, and actions that would apply to the project and were adopted for the purpose of avoiding or mitigating an environmental impact as related to cultural resource issues:

Goal Pres-1	Demonstrate an appreciation of the historic and cultural landmarks that remind residents and visitors of Belvedere's unique culture and history through activities, materials and procedures that recognize valuable historic resources and plan for their preservation.
Policy Pres-1.1	Promote awareness of historic resources in Belvedere and their exceptional style, design, materials, craftsmanship, integrity, and rarity.
Action Pres-1.1.1	Support the development of educational materials that highlight Belvedere's history through its buildings and neighborhood context.
Action Pres-1.1.2	Provide known historical information about residences at time of resale through Residential Building Reports.
Policy Pres-1.2	Encourage owners of historic properties to pursue local, state or national designation of their properties as historic resources. Promote the benefits of historic designation such as the Mills Act tax credit, the use of alternate building codes for rehabilitation, and the potential for zoning exceptions as noted in the policy above. Where feasible, mitigate the costs associated to property owners with preservation of historic resources.
Policy Pres-1.3	Promote awareness of prehistoric resources in Belvedere. Support the development of educational materials that highlight Belvedere's history prior to urbanization. Provide information about known prehistoric resources (both archaeological and FIGR cultural resources) on properties at time of resale through Residential Building Reports.

Goal Pres-2 Encourage development patterns and architecture in keeping with the City's past by preserving and enhancing buildings of special historic and/or architectural interest.

Policy Pres-2.1 Create and maintain tools to alert residents and City Staff of the potential existence of historic resources, including a Historic Resource Sensitivity Map. This will ensure that future development applications are reviewed for potential impacts to potential historic resources.

Action Pres-2.1.1 Maintain an up-to-date list of Buildings with Historic Designation in Belvedere (Belvedere Historic Resources Inventory).

Action Pres-2.1.2 Maintain an up-to-date Directory of Historic Properties from the State Office of Historic Preservation (State Historic Resources Inventory).

Action Pres-2.1.3 Maintain an up-to-date Historic Resource Sensitivity Map. Utilize the map to educate the community about existing and potential historic resources and to determine which properties should be examined for their potential to be eligible for listing on either the local or state Historic Resource Inventories when a development application is received on the parcel.

- High sensitivity parcels: Require that a formal historic resource assessment be completed to determine if the resource is eligible for listing. (DPR form 523A and B to be completed by an Architectural Historian)
- Medium sensitivity parcels: Require that an informal assessment be completed to determine if the resource appears to be eligible for listing. Informal assessment could include information gathered from property owner, City or County records, Landmarks Society, State Office of Historic Preservation, etc.

Policy Pres-2.2 Consider zoning variances and exceptions for properties on the Historic Resources Inventory that can encourage the continued use (and appropriate expansion) of a historic structure that may not meet the current zoning code standards in terms of required setbacks, building height, etc.

Policy Pres-2.3 Develop standard mitigation measures that, when followed, can reduce the impacts to historic resources to a less-than-significant level.

Goal Pres-3 Demonstrate sensitivity to Belvedere's prehistoric past by establishing formal procedures for minimizing and mitigating impacts to archaeologically and culturally significant resources.

Policy Pres-3.1 Continue to protect cultural, archaeological, and paleontological resources.

Action Pres-3.1.1 Encourage property owners who have encountered archaeological or cultural resources on their parcel to avoid the resource if at all possible, followed by minimizing the impact to the resource, and resource relocation as a last option.

Action Pres-3.1.2 Require that all archaeological or cultural resource surveys or reports be filed with the Northwest Information Center (NWIC) at the conclusion of the work.

Action Pres-3.1.3 Develop a standard set of archaeological and cultural resource conditions of approval that can be applied to all new development projects that will apply in the event of a discovery.

Action Pres-3.1.4 Develop standard mitigation measures that, when complied with, can reduce the impacts to archaeological or cultural resources to a less-than-significant level.

Action Pres-3.1.5 Locate and design development to avoid impacts on sites with identified archaeological resources by placing structures to avoid the site, incorporating the site into a permanent open space area, covering the site with a layer of soil, deeding the site as a permanent conservation easement, or taking other actions recommended by the archaeologist, as approved by the City.

Action Pres-3.1.6 In the event unanticipated paleontological resources are uncovered during construction, all work must be halted and an evaluation must be undertaken by a qualified paleontologist to identify the appropriate mitigation for the feature.

Policy Pres-3.2 Continue to consult with the Federated Indians of Graton Rancheria on issues of mutual concern such as the continued preservation of Native American cultural resources, as well as when amending the General Plan, adopting or amending a Specific Plan, designating open space, and at any other times as required by State Law.

Action Pres-3.2.1 Develop and implement consultation protocols with the Federated Indians of Graton Rancheria for the review of development proposals. The protocols should include thresholds for requiring FIGR monitoring or involvement in project review.

Policy Pres-3.3 Create and maintain tools to alert residents and City Staff of the potential existence of archaeological and cultural resources, including a Prehistoric Resource Sensitivity Map. When receiving a development application, Staff shall consult the Sensitivity Map to determine the potential presence of historic and/or prehistoric resources.

Action Pres-3.3.1 Maintain an up-to-date Prehistoric Resource Sensitivity Map. Utilize the map to develop protocols for development proposals that involve ground disturbance, such as:

- High sensitivity parcels: Require test borings or test excavations, and consultation with the Federated Indians of Graton Rancheria. Potential need for a complete resource survey, data recovery, archaeological monitor and Native American monitor on-site, and a monitoring plan.
- Medium sensitivity parcels: Inform property owner of the potential need for test borings or test excavations if site inspections or ground disturbance

yields potential evidence of archaeological or cultural resources. Presence of midden soil may be evidence of archeological or cultural resources.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This section discusses the potential impacts on cultural resources that could result from implementation of the project. Included are (1) the criteria of significance, which establish the thresholds for determining whether an impact is significant; (2) the cultural resources impacts that could result from construction and/or operation of the project and any necessary mitigation measures to reduce significant impacts; and (3) cumulative impacts on cultural resources.

Significance Criteria

Following PRC Sections 21083.2 and 21084.1, and Section 15064.5 and Appendix G of the CEQA Guidelines, cultural resource impacts are significant if the project would:

1. Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5;
2. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5; or
3. Disturb any human remains, including those interred outside of dedicated cemeteries.

CEQA Guidelines Section 15064.5 defines *substantial adverse change* as physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource is materially impaired.

CEQA Guidelines Section 15064.5(b)(2) defines *materially impaired* for purposes of the definition of substantial adverse change as follows:

> The significance of an historical resource is materially impaired when a project:
>
> (A) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources; or
>
> (B) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
>
> (C) Demolishes or materially alters in an adverse manner those physical characteristics of a Historical Resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

CEQA requires that if a project would result in an effect that may cause a substantial adverse change in the significance of a historical resource or would cause significant effects on a unique archaeological resource, alternative plans or mitigation measures must be considered. Therefore, prior to assessing effects or developing mitigation measures, the significance of cultural resources must first be determined. The steps that are normally taken in a cultural resources investigation for CEQA compliance are as follows:

- Identify potential historical resources and unique archaeological resources;
- Evaluate the significance of the potential historical resources; and
- Evaluate the effects of the project on eligible (significant) historical resources and unique archaeological resources.

Less-than-Significant Impacts

The project would not have any less-than-significant impacts on cultural resources related to the above significance criteria.

Potentially Significant Impacts

Impact CULT-1: The project would cause a substantial adverse change in the significance of a historical resource pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15064.5. (PS)

There is one built-environment historical resource adjacent to the project area (China Cabin – P-21-1055) and one archaeological resource being treated as a historical resource within the project site.

The impact assessment prepared for the project (ECORP, 2022) concluded that the use of an impact hammer within 52 feet of the China Cabin could produce vibration levels that exceed the threshold for historic and old buildings, thereby affecting its architectural significance and potentially making the resource no longer eligible for the CRHR under Criterion 3. Incorporation of procedures to monitor and address vibration that exceeds the threshold to avoid impact would reduce this impact to less than significant.

> *Mitigation Measure CULT-1a: To minimize architectural and structural damage to the China Cabin, no more than a peak particle velocity (PPV) of 0.25 inches per second (in/sec) is recommended at the structure. Furthermore, if a 0.25 PPV level or lower is maintained, project construction activities would not affect character-defining features, the structural integrity, and interior architectural features, resulting in no impact on the integrity or significance of the China Cabin building, meaning the proposed project would have a less-than-significant impact on this historical resource as defined by CEQA. The following measures to minimize architectural and structural damage to the China Cabin building from construction-related ground vibrations shall be implemented:*
>
> 1. *A preconstruction survey and structural integrity inspection shall be conducted at the potentially affected historic buildings. The preconstruction survey shall include descriptions and photographs of both the exterior and interior of the buildings that could*

potentially be damaged during construction, including documentation of existing damage such as cracks and loose or damaged features.

2. *Vibration levels at the China Cabin shall be monitored during construction activities with appropriate equipment such as a seismograph (monitor) and geophone (sensor).*
3. *Construction vibration specifications shall be included as part of the construction contract documents (e.g., "The contractor shall not exceed the construction vibration criterion of 0.25 in/sec PPV, at the historic structures, within the established critical distance for each construction activity. If at any time the ground vibration level exceeds the specified criterion of 0.25 in/sec PPV due to any construction activity, then the construction operation shall stop. Construction shall not recommence until the source of vibration is determined and replaced by an alternative construction technique or equipment.")*
4. *In the event the project exceeds the construction vibration criterion of 0.25 in/sec PPV, a historic architect or qualified historic preservation professional shall inspect the China Cabin and proceed as follows:*
    - *If no damage has occurred to the China Cabin, the historic architect or qualified historic preservation professional shall submit a monthly report to the City of Belvedere for review. This report shall identify and summarize the vibration level exceedances and describe the actions taken to reduce vibration.*
    - *If vibration has damaged the China Cabin, the historic architect or qualified historic preservation professional shall immediately notify the City and prepare a damage report documenting the features of the China Cabin that has been damaged.*
    - *Should damage occur to the China Cabin due to construction-related vibration, the China Cabin shall be restored to its pre-construction condition in consultation with the historic architect or qualified historic preservation professional and the City.*
    - *After construction is complete, the City shall receive a final report from the historic architect or qualified historic preservation professional. The report shall include, at minimum, collected monitoring records, building condition summaries, descriptions of all instances of vibration level exceedance, identification of damage incurred due to vibration, and corrective actions taken to restore the China Cabin to its pre-construction condition.*

.Mitigation Measure CULT-1b: The City of Belvedere shall retain a qualified professional archaeologist to monitor ground-disturbing activities. The archaeologist shall meet the Secretary of the Interior's professional qualifications standards for archaeology. The archaeologist shall have the authority to stop grading or construction work within 50 feet of any discovery of potential historical or archaeological resources in order to implement the procedures in Mitigation Measure CULT-3 and make a finding of significance under Section 15064.5 of the California Environmental Quality Act (CEQA) Guidelines.

Mitigation Measure CULT-1c: If subsurface deposits believed to be cultural or human in origin are discovered during construction by the monitor, all work must halt within a 50-foot radius of the discovery. A qualified professional archaeologist, who will evaluate the significance of the find, shall have the authority to modify the no-work radius as appropriate,

using professional judgment. The following notifications shall apply, depending on the nature of the find:

- *If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately, and no agency notifications are required.*
- *If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, they shall immediately notify the City of Belvedere and the United States Army Corps of Engineers (Corps), which shall consult on a finding of eligibility. If the find is determined to be a historical resource under the California Environmental Quality Act (CEQA) or a historic property under National Historic Preservation Act Section 106, then, appropriate treatment measures would be implemented. Work may not resume within the no-work radius until the City of Belvedere and the Corps, through consultation as appropriate, determine either that (1) the site is not a historical resource under CEQA or a historic property under Section 106, or (2) the treatment measures have been completed to their satisfaction. The preferred treatment would be avoidance and preservation in place.*
- *If the find includes human remains, or remains that are potentially human, Mitigation Measure CULT-3 shall apply.*

With the incorporation of Mitigation Measure CULT-1a, CULT-1b, and CULT-1c, the impacts on the China Cabin and the archaeological historical resource would be less than significant. (LTS)

Impact CULT-2: The project could cause significant adverse changes in the significance of an archaeological resource pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15064.5. (PS)

The cultural resources inventory concluded that due to the presence of one prehistoric archaeological site located within the project site, two prehistoric archaeological sites located adjacent to the project site, and the multiple prehistoric archaeological sites located throughout Belvedere Island, there always exists the potential for buried pre-contact archaeological sites in the project area. There is a high likelihood for pre-contact archaeological sites in the project area due to its proximity to intermittent drainages and San Francisco Bay. Another factor to consider is that 13 pre-contact resources have been previously identified within a 0.5-mile radius of the project site, seven of which yielded human burials. Therefore, the probability of buried pre-contact archaeological sites is considered moderate to high. Human remains have been uncovered at several locations within or adjacent to the project site. In addition, the project site has a moderate risk potential for encountering historic-era archaeological deposits and resources. The paved and urban environment also impaired the visibility of cultural resources present during the field survey. Ground disturbance associated with the project could encounter known or unknown pre-contact resources, and if it does, the impact could be significant. Incorporation of procedures to monitor and address unanticipated discoveries would reduce this impact to less than significant.

Mitigation Measure CULT-2: With the implementation of Mitigation Measures CULT-1b and CULT-1c, the impact on known and unknown archaeological resources would be less than significant. (LTS)

Impact CULT-3: The project could disturb human remains, including those interred outside of dedicated cemeteries. (PS)

As there are known archaeological resources within and adjacent to the project site known to contain human remains, it is possible that human remains could be uncovered during ground-disturbing activities, including in areas not previously known to contain human remains. If human remains are encountered during project construction, a significant impact could result. Implementation of procedures to address discoveries in accordance with existing state law would reduce this impact to less than significant.

> *Mitigation Measure CULT-3: If human remains, or remains that are potentially human, are encountered, the City of Belvedere shall ensure reasonable protection measures are taken to protect the discovery from disturbance (in accordance with Assembly Bill [AB] 2641). The qualified professional archaeologist retained by the City (see Mitigation Measure CULT-1b) shall notify the Marin County Coroner (per Section 7050.5 of the California Health and Safety Code). The provisions of Section 7050.5 of the California Health and Safety Code, Section 5097.98 of the California Public Resources Code (PRC), and AB 2641 shall be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, the Coroner shall notify the Native American Heritage Commission (NAHC), which then would designate a Native American Most Likely Descendant (MLD) for the project (Section 5097.98 of the PRC). The designated MLD would have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, the NAHC can mediate (Section 5097.94 of the PRC). If no agreement is reached, the landowner must rebury the remains where they would not be further disturbed (Section 5097.98 of the PRC). This shall also include either recording the site with the NAHC or the appropriate California Historical Resources Information System Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work may not resume within the no-work radius until the City of Belvedere, through consultation with the MLD as appropriate, determines that the treatment measures have been completed to its satisfaction.*
>
> *Implementation of Mitigation Measure CULT-3 would reduce impacts on human remains and dedicated cemeteries to less than significant. (LTS)*

Cumulative Impacts

City policy provides for the protection of archaeological resources and human remains with the implementation of General Plan Policies Pres 1-1 through 3-3.1. These policies are supplemented by state regulations and CEQA mitigation, which provide protection of human remains. The implementation of these policies and additional mitigation required at the project level would reduce cumulative impacts on archaeological resources, as well as human remains, to a less-than-significant level. With Mitigation Measures CULT-1 through CULT-3 incorporated, the potential impacts on cultural resources associated with the proposed project would be reduced to a less-than-significant level. Therefore, the proposed project's impacts on historical resources, archaeological resources (including unique archaeological resources), and human remains or dedicated cemeteries are considered less than cumulatively considerable.

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4.5 ENERGY

INTRODUCTION

This section of the Draft Environmental Impact Report (EIR) describes the existing setting and the project's potential impacts on energy resources.

ENVIRONMENTAL SETTING

Pacific Gas and Electric Company (PG&E) provides electricity and natural gas to Belvedere, including the project site. Existing facilities at the project site include a network of natural gas and electrical lines in the street rights-of-way (Beach Road and San Rafael Avenue). Energy is used at the project site for traffic signals and street lighting.

In Belvedere and elsewhere in Marin County, renewable electricity is available from Marin Clean Energy (MCE), a public, not-for-profit electricity provider that gives all PG&E electric customers the choice of having 60 to 100 percent of their electricity supplied from renewable sources (e.g., solar, wind, bioenergy, geothermal, and hydroelectric) at competitive rates (MCE, 2022). MCE offers an alternative to PG&E's electric supply that is designed to allow electric consumers to choose renewable energy, helping to reduce dependence on imported fossil fuels and foster development of local green power generation and clean technologies. MCE is responsible for sourcing the power and purchases the energy supply, while PG&E continues to deliver the energy, maintain and repair transmission lines, and provide customer service and billing (City of Belvedere, 2010).

REGULATORY FRAMEWORK

Federal Regulations

No federal regulations related to energy would apply to the project.

State Regulations

Various State of California regulations encourage energy efficiency and use of renewable energy. The California Air Resources Board enforces California Code of Regulations Title 13, Section 2485 (Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling). Among other requirements, these regulations limit the idling time of diesel construction equipment to 5 minutes. The State of California's Low Carbon Fuel Standard is designed to reduce the transportation sector's dependence on petroleum by encouraging the production and use of cleaner low-carbon transportation fuels (California Air Resources Board, 2022). Senate Bill 350 requires the state to increase its renewable electricity procurement goals and double statewide energy efficiency savings in electricity and natural gas end uses by 2030 (California Energy Commission, 2022). (See additional discussion of State of California energy efficiency regulations in *Section 4.7, Greenhouse Gas Emissions*, of this EIR.)

Local Regulations and Policies

No local regulations or policies, such as City of Belvedere General Plan policies, are relevant to the project's potential energy impacts.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Significance Criteria

For the purposes of this Draft EIR and based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines, implementation of the project would have a significant effect on energy resources if it would:

1. Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or
2. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Less-than-Significant Impacts

Energy Consumption

The project would not result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation.

Energy Use During Project Construction

The project involves installation of sheet piles at the project site. Modest amounts of energy would be used during construction, but this consumption would be temporary. Project construction would require energy for the transportation of building materials, preparation of the project site, and construction of infrastructure. In addition, worker vehicle trips associated with construction would consume energy. Solar-powered traffic signals might be used at night and on weekends during construction (see Construction Management Plan in Appendix C of this EIR).

The project would be constructed over a period of approximately 8 months. Since construction activities would be temporary, they would not result in long-term energy consumption. Construction contractors have financial incentives to ensure the efficient use of fuel by the construction equipment (since excess fuel usage reduces profits). Therefore, it is generally assumed that fuel used during construction would be conserved to the maximum extent feasible. Furthermore, regulations enforced by the California Air Resources Board (Title 13, Section 2485 of California Code of Regulations) limit the idling time of diesel construction equipment to 5 minutes. It is anticipated that energy consumption during the construction period would be minimized to the maximum extent practical. This qualitative review therefore finds that the energy consumption of construction equipment and construction operations would not be inefficient. Therefore, energy use during project construction would be less than significant.

Energy Use After Construction is Completed

Once construction is completed, the project would not change existing energy consumption at the project site. Energy use would be limited to existing lighting of landscaped areas. The project's operational energy use would be less than significant.

Conclusion

Project construction and operation would not result in wasteful, inefficient, or unnecessary consumption of energy. The impact would be less than significant, and no mitigation is necessary.

Conflict with Plans for Renewable Energy or Energy Efficiency

The project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

During construction, the project would be required to abide by State of California regulations limiting the idling time of diesel construction equipment to 5 minutes. Once construction is completed, the project would not change existing levels of energy use at the project site. The project therefore would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. (As noted under *Regulatory Framework* above, there are no local regulations or policies, such as City of Belvedere General Plan policies, relevant to the project's potential energy impacts.) The impact would be less than significant, and no mitigation is necessary.

Potentially Significant Impacts

The project would not have any potentially significant impacts related to energy resources.

Cumulative Impacts

For energy resources, the geographic scope for assessing cumulative impacts is PG&E's northern and central California service area.

The project would use minor amounts of energy during construction and once completed, would not change existing energy consumption at the project site. The project would comply with State of California requirements for energy conservation during construction. The project therefore would not combine with other past, present, or probable future projects to produce a significant cumulative impact on energy resources.

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4.6 GEOLOGY/SOILS

INTRODUCTION

This section of the Draft Environmental Impact Report (EIR) evaluates the potential geology and soils impacts of the Belvedere Seismic Upgrade Project (project or BSUP). The environmental setting section describes the geologic environment of the project area based on a site-specific Geotechnical Investigation (Miller Pacific Engineering Group, 2022), as well as maps and technical reports from United States Geological Survey (USGS), the California Geological Survey (CGS), and other sources. The regulatory framework applicable to geologic and seismic hazards is summarized. The potential project impacts related to these hazards are analyzed, including impacts from strong ground shaking, liquefaction, lateral spreading, differential settlement, and unstable or expansive soils. Appropriate mitigation measures are identified, as necessary.

ENVIRONMENTAL SETTING

Geologic Conditions

Geology

The project site is located within the Coast Ranges geomorphic province,[1] a relatively geologically young and seismically active region (CGS, 2002a; Norris and Webb, 1976). The Coast Ranges are mountain ranges (approximately 2,000 to 4,000 and occasionally 6,000 feet elevation above sea level) and valleys that trend northwest, approximately parallel to the San Andreas Fault, from near the Oregon border to southern California. The only major break in the Coast Ranges is the depression containing San Francisco Bay; the project site is located within this region. The project site is located between the Tiburon Peninsula and Belvedere Island and between Belvedere Island and Corinthian Island in an area that was formerly within the waters of Richardson Bay and San Francisco Bay. Silt and clay particles deposited in San Francisco Bay have formed the soft and highly compressible "Bay Mud" that underlies San Francisco Bay and its margins. The area of the project site and the Belvedere Lagoon were formed in the late 1940s by constructing two “land bridges” connecting Belvedere Island to the Tiburon Peninsula and Corinthian Island. The interior lagoon was then dredged, and the dredge materials were used as fill to create the existing levees within the project site and the streets and properties within and surrounding the Belvedere Lagoon. The placement of this fill material caused consolidation of the underlying Bay Mud, resulting in slow vertical settlement of the levees, reducing the top of levee elevation and effectiveness of the levees (Miller Pacific Engineering Group, 2022).

Topography

The project site is relatively flat, ranging in elevation from approximately 8 to 10 feet above sea level (Miller Pacific Engineering Group, 2022).

[1] A geomorphic province is a naturally defined geologic region that displays a distinct combination of features based on geology, faults, topography, and climate. Eleven geomorphic provinces are recognized in California.

Existing Subsurface Conditions

The surface layer consists of about 5 to 15 feet of loose to medium dense artificial fill soils, composed of variable sand, silt, and clay with inclusion of larger cobble and boulders. Interbedded layers of saturated, soft, compressible silty clay (Bay Mud) and loose to medium-dense sand and silt extend to variable depths in excess of 120 feet. Shale bedrock exists at shallow depth on the north end of San Rafael Avenue as well as on the southwest side of Beach Road and underlies the alluvial soil layers. The groundwater levels are expected to be influenced by the tide and can be expected to be at or near the tidal elevation (Miller Pacific Engineering Group, 2022).

Seismic Conditions

The entire San Francisco Bay Area (Bay Area) is located within the San Andreas Fault Zone, a complex of active faults (i.e., faults showing evidence of rupture within the past 11,000 years). Numerous historic earthquakes have been generated in northern California by the San Andreas Fault Zone. This level of active seismicity results in relatively high seismic risk in the Bay Area. Regional active faults in the Bay Area are shown in Figure 4.6-1.

The Working Group on California Earthquake Probabilities and the USGS have predicted a 22 percent probability of a Moment Magnitude (M_w)[2] 6.7 or greater earthquake on the Northern San Andreas Fault between 2014 and 2043, a 33 percent chance on the Hayward Fault, and a total probability of 72 percent that an earthquake of M_w 6.7 or greater will occur on one of the regional Bay Area faults during that time (USGS, 2016).

Soils, Geologic, and Seismic Hazards

The artificial fill soils and natural geology underlying the project site present potential hazards related to ground failure and unstable soils. Seismic hazards are generally classified in two categories: primary seismic hazards (surface fault rupture and ground shaking) and secondary seismic hazards (liquefaction and other types of seismically induced ground failure). These hazards are discussed below and provide the initial context for further evaluation in the impact analysis.

Surface Rupture

Surface rupture occurs when the ground surface is broken due to fault movement during an earthquake. Surface rupture generally can be assumed to occur along an active or potentially active major fault trace. Areas susceptible to fault rupture are delineated by the CGS Alquist-Priolo Earthquake Fault Zones. The Alquist-Priolo Earthquake Fault Zoning Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The Alquist-Priolo Earthquake Fault Zoning Act requires specific geological investigations prior to certain kinds of development to reduce the threat to public health and safety and to minimize the loss of life and property posed by earthquake-induced ground failure. The project site is not located within an Alquist-Priolo Earthquake Fault Zone (Miller Pacific Engineering Group,

[2] M_W, as opposed to Richter Magnitude, is now commonly used to characterize seismic events. M_W is determined from the physical size (area) of the rupture of the fault plane, the amount of horizontal and/or vertical displacement along the fault plane, and the resistance to rupture of the rock type along the fault.

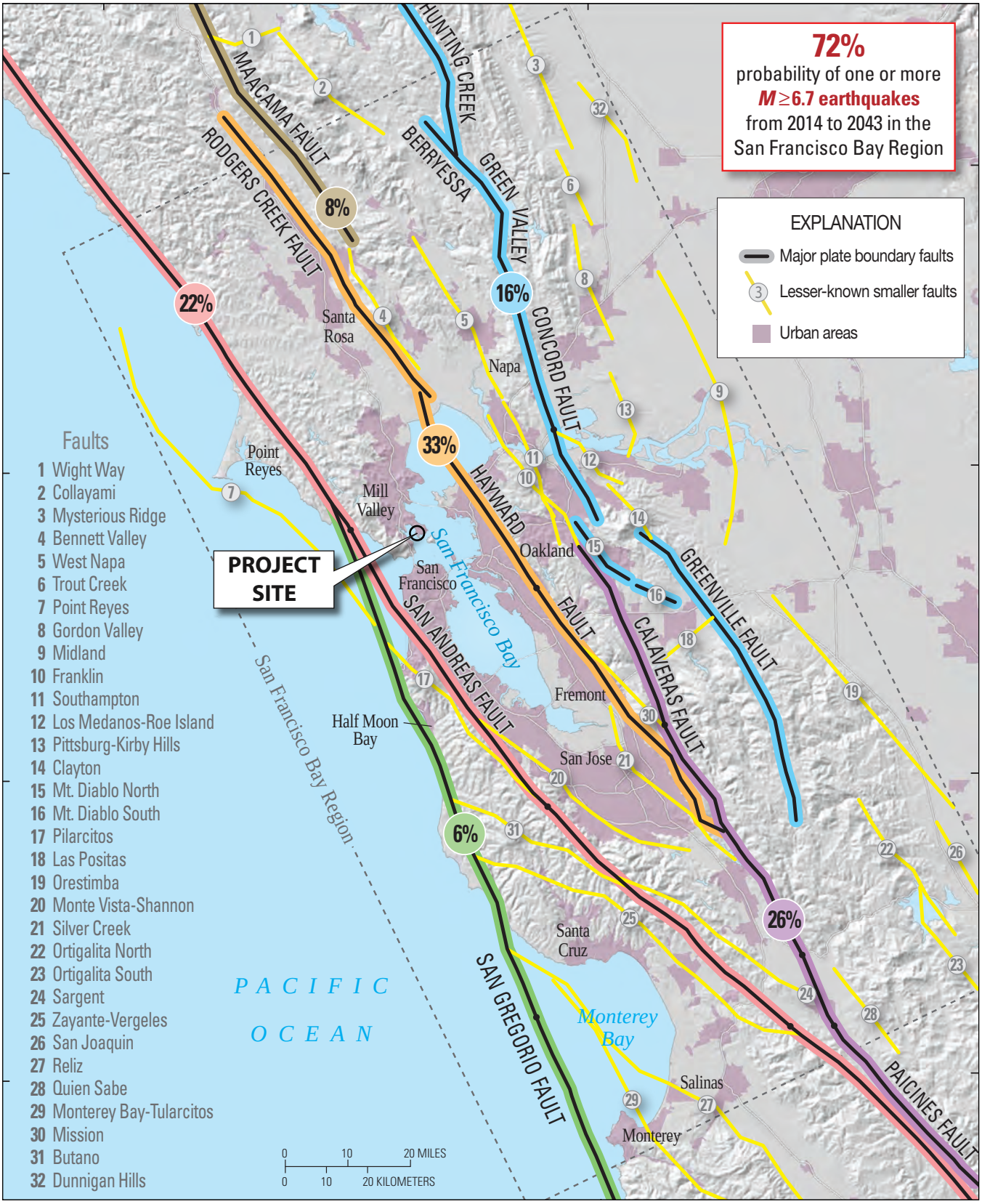

Figure 4.6-1

REGIONAL FAULTS

SOURCE: USGS, 2016

2022). The nearest Alquist-Priolo Earthquake Fault Zones are the Hayward Fault and San Andreas Fault, located about 10 miles east and west of the project site, respectively (see Figure 4.6-1).

Ground Shaking

Ground shaking is a general term referring to all aspects of motion of the earth's surface resulting from an earthquake and is normally the major cause of damage in seismic events. The extent of ground shaking is controlled by the magnitude and intensity of the earthquake, distance from the epicenter, and local geologic conditions. The Modified Mercalli Intensity Scale (MMI) is the most commonly used scale for measurement of the subjective effects of earthquake intensity (see Table 4.6-1). The MMI values range from I (earthquake not felt) to XII (damage nearly total), and intensities ranging from VII to XII can cause moderate to significant structural damage.

The project site will likely experience seismic ground shaking similar to other areas in the seismically active San Francisco Bay Area. Earthquakes along any of several active faults in the region, as shown in Figure 4.6-1, could cause moderate to strong ground shaking at the site. The potential for strong seismic shaking at the project site is high. Due to their proximity, the San Andreas, Hayward, San Gregorio, and Rodgers Creek Faults present the highest potential for severe ground shaking (Miller Pacific Engineering Group, 2022).

The Geotechnical Investigation (Miller Pacific Engineering Group, 2022) indicates that both deterministic and probabilistic evaluations have been performed to estimate the strong seismic shaking at the site. Deterministic methods are commonly used for the majority of residential, commercial, and industrial developments. Probabilistic methods are used for "critical" facilities such as hospitals and schools or where "superior" seismic performance is desired. As stated in the Geotechnical Investigation, the U.S. Army Corps of Engineers considers various design earthquakes and ground motions for civil projects, including:

- Operating Basis Earthquake (OBE) – This is the earthquake that can be reasonably expected to occur during the service life of the project, typically a 50 percent chance of exceedance in 100 years (144-year average return period).
- Maximum Credible Earthquake (MCE) – The MCE is defined as the largest earthquake that can be reasonably expected to be generated by a specific source/fault. The MCE is evaluated using deterministic methods. For the project site, this would be the median peak acceleration of 0.31 units of gravity (g) for a magnitude 8.04 event on the San Andreas Fault.
- Maximum Design Earthquake (MDE) – The MDE is the maximum level of ground motion to be considered for design or evaluation. The associated performance requirement of the project should not result in loss of life or catastrophic failure. The MDE is an event with a 10 percent chance of exceedance in 100 years (average return period of 950 years).

Considering the above possible design earthquake levels, the probabilistic acceleration with a 10 percent chance of exceedance in 50 years (475-year average return period) of 0.46g was chosen as the basis of design. This level of acceleration corresponds with the median plus one standard deviation using deterministic evaluation for a magnitude 8.0 earthquake occurring on the San Andreas Fault at the mapped closest distance to the site, and also corresponds with the U.S. Army Corps of Engineers MCE. This design acceleration was discussed with the project design team and used in the pseudo-static slope stability analyses (Miller Pacific Engineering Group, 2022). A

magnitude 8.0 earthquake corresponds to a Modified Mercalli Intensity of X to XI (CGS, 2002b), which could result in major damage (see Table 4.6-1).

TABLE 4.6-1 MODIFIED MERCALLI INTENSITY SCALE

Intensity	Effects
I.	Not felt except by a very few under especially favorable circumstances.
II.	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III.	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration like passing of truck. Duration estimated.
IV.	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V.	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
VI.	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
VII.	Everybody runs outdoors. Damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.
VIII.	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.
IX.	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
X.	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.
XI.	Few, if any, (masonry) structures remain standing. Bridges destroyed. Board fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.
XII.	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted.

Source: CGS, 2002b.

Liquefaction, Lateral Spreading, and Seismic Settlement

Liquefaction is the temporary transformation of loose, saturated granular sediments from a solid state to a liquefied state as a result of seismic ground shaking. In the process, the soil undergoes transient loss of strength, which commonly causes ground displacement or ground failure to occur. Because saturated soils are a necessary condition for liquefaction, soil layers in areas where the groundwater table is near the surface have higher liquefaction potential than those in which the water table is located at greater depths. The potential for liquefaction-induced ground failure (e.g., loss of bearing strength, ground fissures, sand boils) depends on the thickness of the liquefiable soil layer relative to the thickness of the overlying non-liquefiable material.

Lateral spreading is a form of horizontal displacement of soil toward an open channel or other "free" face, such as an excavation boundary. In a lateral spread failure, a layer of ground at the surface is carried on an underlying layer of liquefied material over a nearly flat surface toward a river channel or other bank. The lateral spreading hazard tends to mirror the liquefaction hazard for a site (assuming a free face is located nearby). There are open faces along the existing levees within the project site that could allow for lateral spreading to occur.

The Geotechnical Investigation included a liquefaction analysis that concluded that the levees of the project site could experience up to 6 inches of total and differential[3] liquefaction-induced settlement and lateral spreading deformations of several feet under existing conditions (Miller Pacific Engineering Group, 2022).

Seismic settlement (also referred to as cyclic densification or differential compaction) can occur when non-saturated, cohesionless sand or gravel soil is densified by earthquake vibrations. When the degree of cyclic densification varies based on variations in soil types, differential settlement may occur, which can result in greater damage to improvements compared to relatively equal settlement. The Geotechnical Investigation indicates that the stiff/dense fill soils above the water level and underlying Bay Mud at the project site are generally not prone to seismically induced densification. Therefore, the likelihood of seismically induced ground settlement at the project site is low (Miller Pacific Engineering Group, 2022).

Landslides/Slope Instability

Slope failure can occur as either rapid movement of large masses of soil (landslide) or slow, continuous movement (creep) on slopes of varying steepness. Areas susceptible to landslides are characterized by steep slopes and downslope creep of surface materials.

The Geotechnical Investigation indicates that the slopes along the existing levees of the project site are stable (have adequate factors of safety against instability) under static conditions. However, under seismic conditions (i.e., during earthquake related ground shaking), the factors of safety against slope instability are less stable due to the low strength properties of the underlying Bay Mud and low strength of liquefiable sands, and slope instability could lead to vertical deformations of 6 to 12 inches and lateral deformations of 1 to 4 feet under existing conditions (Miller Pacific Engineering Group, 2022).

Settlement, Differential Settlement, and Subsidence

Settlement is the lowering of the land surface elevation typically as a result of loading (i.e., placing heavy loads such as fill material or structures), which often occurs with the development of a site. Settlement or differential settlement could occur when improvements are built on low-strength foundation materials (loose artificial fill materials) or if improvements straddle the boundary between different types of subsurface materials (e.g., a boundary between native material and/or new engineered fill). Settlement from new loads generally occurs slowly enough that its effects are not dangerous, but it can cause significant damage to improvements such as buildings and utilities over time. More rapid settlement can also be induced by subsurface vibrations, which can consolidate loose soils.

[3] Differential settlement refers to non-uniform amounts of settlement within specific area, which in this case means that the settlement could range from 0 to 6 inches from point to point anywhere over the levee areas.

The project site is underlain by soft, compressible Bay Mud that varies in thickness from 30 feet to more than 120 feet. Fill material used to construct the existing levees on the project site has induced consolidation of the soft, compressible Bay Mud and in turn has caused settlement of the ground surface. The total amount of settlement depends on the amount of surface loading, thickness, and compression properties of the Bay Mud. The rate at which settlement occurs depends on the thickness of the Bay Mud deposit, the distance to a drainage layer, and the vertical permeability of the Bay Mud. In general, the Bay Mud consolidates quicker following initial loading and slows over time. Consolidation settlement for deep Bay Mud often takes decades to complete. Following consolidation, secondary compression occurs but is generally a fraction of the total settlement and occurs over a much longer time (Miller Pacific Engineering Group, 2022).

Most of the fill placement at the project site occurred in 1940. The Geotechnical Investigation calculated the estimated settlement that has occurred to date and the rate of future settlement that could occur for varying thicknesses of Bay Mud by using typical Bay Mud consolidation properties and laboratory results. The Geotechnical Investigation found that most of the expected settlement from the original construction of the levees has already occurred, and areas underlain by 80 to 100 feet of Bay Mud could still experience approximately 0.4- to 0.8-foot of additional settlement, respectively, over the next 100 years under existing conditions (Miller Pacific Engineering Group, 2022).

Subsidence is the lowering of the land-surface elevation. The mechanism for subsidence is generally related to groundwater pumping and subsequent consolidation of loose aquifer sediments. Subsidence may also be related to settlement as discussed above. Hazards associated with subsidence include increased risks of flooding and damage to underground utilities as well as above-ground structures. Other potential effects of subsidence include changes in the gradients of stormwater and sanitary sewer drainage systems for which the flow is gravity driven.

Paleontological Conditions

Paleontological resources include fossilized remains or traces of organisms, including plants, vertebrates (animals with backbones), invertebrates (e.g., starfish, clams, ammonites, and marine coral), and microscopic plants and animals (microfossils), including their imprints, from a previous geological period. Collecting localities (i.e., areas that include in-situ fossils) and the geologic formations containing those localities are also considered paleontological resources as they represent a limited, non-renewable resource and, once destroyed, cannot be replaced. The Society of Vertebrate Paleontology (SVP) has established guidelines for the identification, assessment, and mitigation of adverse impacts on non-renewable paleontological resources. The SVP has helped define the value of paleontological resources and, in particular, states that significant paleontological resources are fossils and fossiliferous deposits consisting of identifiable vertebrate fossils, large or small; uncommon invertebrate, plant, and trace fossils; and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 years) (SVP, 2010).

The project site is underlain by artificial fill over Bay Mud. Artificial fill is considered to have a low sensitivity for paleontological resources due to its already disturbed nature. Although plant and invertebrate fossil remains have been found in Bay Mud, which occurs at variable depths across the project site alignment, these fossils are abundant, and their occurrence would not be

noteworthy. Therefore, the artificial fill and Bay Mud are considered to have a low paleontological sensitivity.

REGULATORY FRAMEWORK

Federal Regulations

The National Earthquake Hazards Reduction Program (NEHRP) was established by the U.S. Congress when it passed the Earthquake Hazards Reduction Act of 1977, Public Law 95–124. In establishing NEHRP, Congress recognized that earthquake-related losses could be reduced through improved design and construction methods and practices, land use controls and redevelopment, prediction techniques and early-warning systems, coordinated emergency preparedness plans, and public education and involvement programs. The four basic NEHRP goals are:

- Develop effective practices and policies for earthquake loss reduction and accelerate their implementation.
- Improve techniques for reducing earthquake vulnerabilities of facilities and systems.
- Improve earthquake hazards identification and risk assessment methods, and their use.
- Improve the understanding of earthquakes and their effects.

Implementation of NEHRP priorities is accomplished primarily through original research, publications, and recommendations to assist and guide state, regional, and local agencies in the development of plans and policies to promote safety and emergency planning.

State Regulations

California Alquist-Priolo Earthquake Fault Zoning Act

The California Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972, and its main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active earthquake faults. The Alquist-Priolo Earthquake Fault Zoning Act requires the State Geologist to establish regulatory zones (known as Earthquake Fault Zones) around the surface traces of known active faults and to issue appropriate maps. “Earthquake Fault Zones” were called “Special Studies Zones” prior to January 1, 1994. The maps are distributed to all affected cities, counties, and state agencies for their use in planning and controlling new or renewed construction. Local agencies must regulate most development projects within these zones. As mentioned above, Belvedere is not located within an area mapped as subject to surface rupture under the Alquist-Priolo Earthquake Fault Zoning Act, and no known active faults cross the city.

California Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (Public Resources Code Section 2690- 2699.6) directs the CGS to identify and map areas prone to liquefaction, earthquake-induced landslides, and amplified ground shaking. The purpose of the Seismic Hazards Mapping Act is to minimize loss of life and property through the identification, evaluation, and mitigation of seismic hazards. The Seismic Hazards Mapping Act was passed by the legislature following the 1989 Loma Prieta

earthquake. As a result, CGS geologists gather existing geological, geophysical, and geotechnical data from numerous sources to produce the Seismic Hazard Zone Maps. They integrate and interpret these data regionally to evaluate the severity of the seismic hazards and designate those areas prone to ground shaking, liquefaction, and earthquake-induced landslides as Zones of Required Investigation. Cities and counties are required to use the Seismic Hazard Zone Maps in their land use planning and building permit processes. The Seismic Hazards Mapping Act requires that site-specific geotechnical investigations be conducted within Zones of Required Investigation to identify and evaluate seismic hazards and formulate mitigation measures prior to permitting most developments designed for human occupancy. The CGS has completed seismic hazard mapping for the portions of California most susceptible to liquefaction, ground shaking, and landslides (primarily the Bay Area and the Los Angeles basin). The City of Belvedere is currently an "unevaluated area" (i.e., CGS seismic hazard mapping has not been completed).

California Building Code

The 2019 California Building Code, which refers to Part 2 of the California Building Standards Code in Title 24 of the California Code of Regulations, is based on the 2018 International Building Code, and is the most current state building code. The 2019 California Building Code covers grading and other geotechnical issues, building specifications, and non-building structures.

Local Regulations and Policies

City of Belvedere General Plan

The City's General Plan (City of Belvedere, 2010) includes the following policies and actions that would apply to the project and were adopted for the purpose of avoiding or mitigating environmental impacts related to geologic hazards:

Policy HAZ-1.1	Construction shall be located and designed to avoid or minimize the hazards from earthquake, erosion, landslides, floods, and fire.
Action HAZ-1.1.2	All new construction in the City shall ensure that it follows current seismic codes as set forth by the California Building Code (CBC).
Action HAZ-1.1.4	New construction must not compromise public infrastructure which is key to emergency access, egress, and flood prevention.
Policy HAZ-1.2	Require thorough field investigation of geologic hazards as a prerequisite to Design Review and construction approval and require site stabilization to minimize such risks.
Action HAZ-1.2.1	Consult the hazard zones maps in the preparation of Initial Studies required by the California Environmental Quality Act.
Action HAZ-1.2.2	Address hazards in the preparation of [negative] declarations and Environmental Impact Reports required by the California Environmental Quality Act.

Action HAZ-1.2.3 Investigate potential landslide hazards associated with specific project locations as part of Design Review for project applications.

Policy HAZ-1.4 Ensure that the City is equipped for disaster, evacuation, and survival thereafter.

Action HAZ-1.4.2 Ensure that risk to public lifeline utilities, such as those along Beach Road and San Rafael Avenue, be reduced by installing excess flow valves, bracing, flexible materials, flexible joints and connections, joint restraint, strengthening of support structures, or other means.

Action HAZ-1.4.3 Ensure that lifeline utilities at risk of damage due to liquefaction be designed for easy access and repair, and consideration should be given to providing pre-designed replacement/repair fittings to allow rapid bridging of breaks at crucial locations where damage is anticipated.

Policy HAZ-2.6 Continue to evaluate the feasibility and implementation of new seawall construction.

Action HAZ-2.6.1 Establish a citizens' committee comprised of Lagoon-area residents and the BLPOA, among others, to evaluate the feasibility and implementation issues associated with new seawall design and construction. The committee shall evaluate sea walls both along San Rafael Avenue and Beach Road.

Policy HAZ-3.5 Filled land that is underlain by compressible materials (bay mud, marsh, slough) should receive special attention during site planning.

Action HAZ-3.5.1 Soils investigations should include borings and sufficient examination to determine the location of former sloughs and other factors that would accentuate differential settlement. The investigation should delineate those areas where settlement will likely be greatest, subsidence will occur, etc., and should recommend the site preparation techniques that could be employed to preclude hazard.

Action HAZ 3.5.2 Any new construction in Bay margin areas shall carefully consider the potential effects of settlement both on the project and on adjacent properties. New construction can be supported on piles where appropriate.

Action HAZ 3.5.3 All new construction in Bay margin areas shall be designed with the guidance of a qualified geotechnical engineer in accordance with the applicable CBC.

Policy HAZ-3.6 Potential for damage by erosion shall be minimized through preventative measures.

Action HAZ-3.6.1 Proposed new construction projects should comply with applicable City, Regional, and Federal storm water control regulations so as to reduce erosion impacts.

Action HAZ-3.6.2 Surface drainage facilities and vegetative cover on areas of exposed soil shall be maintained appropriately in order to avoid blockage of inlets or uncontrolled discharge to slopes.

Action HAZ-3.6.3 Establish and enforce provisions under storm water management and discharge control ordinances designed or to be designed to control erosion and sedimentation.

Belvedere Municipal Code

The City of Belvedere has adopted the most current state building codes, as indicated in Belvedere Municipal Code Title 16 Chapter 4. The City's Building Division is responsible for reviewing plans, issuing building permits, and conducting inspections. Geotechnical investigation reports for individual projects in Belvedere are reviewed by the City's Building Division prior to issuance of building permits.

Belvedere Municipal Code sections related to geology and soils are as follows:

- Section 16.04.010 adopts the most current state building codes, including the seismic design requirements of the 2019 California Building Code.
- Section 16.15.010 establishes controls on the earthwork permitted by the City in the course of construction. The controls are established for reasons of aesthetics, sound soil engineering practice, erosion control, and water quality protection.
- Section 16.15.050 requires the preparation and implementation of erosion control plans during construction.
- Section 16.16.020 finds that "a substantial area in the City limits consists of lands inundated, or from time to time inundated, and that indiscriminate filling of such lands, excavating or placing piling or other structures therein or thereon can create a hazard to persons and property [not] only in the immediate area thereof, but furthermore, by changing the action of currents, tides, and movements of water by various means, can create a hazard to other lands in the City and to the occupants thereof and, therefore, that the public health, safety, welfare and convenience require that the filling or excavating of such lands or placing of piling or other structures in such places should be so regulated as to eliminate such hazards if possible and, otherwise, should be prohibited."

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Significance Criteria

Based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines, implementation of the proposed project would result in a significant impact related to geology and soils if it would:

1. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: (1) 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; (2) strong seismic ground shaking; (3) seismic-related ground failure, including liquefaction; and (4) landslides;

2. Result in substantial soil erosion or the loss of topsoil;
3. 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 an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse;
4. 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;
5. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater; or
6. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Less-than-Significant Impacts

Surface Rupture

The project would not directly or indirectly cause risks involving rupture of a known earthquake fault.

Surface fault rupture occurs when the ground surface is broken due to fault movement during an earthquake. Fault rupture is generally expected to occur along known active fault traces. Areas susceptible to fault rupture are delineated by the CGS Alquist-Priolo Earthquake Fault Zones map and require specific geological investigations prior to development to reduce the threat to public health and safety and to minimize the loss of life and property posed by earthquake-induced ground failure. The City does not contain any known active faults or faults mapped as subject to surface rupture under the Alquist-Priolo Earthquake Fault Zoning Act. Therefore, the project would have no impact related to surface fault rupture.

Ground Shaking

The project would not directly or indirectly cause risks involving strong seismic ground shaking.

The design and construction of proposed improvements including sheet piles and relocated utilities would be performed in accordance with the California Building Code, which would ensure that these improvements are designed to account for seismic ground shaking forces. Therefore, direct project impacts associated with ground sharking would be less than significant. Potential secondary impacts (e.g., ground failure) due to ground shaking are discussed under *Potentially Significant Impacts* below.

Soil Erosion and Loss of Topsoil

The project would not result in substantial soil erosion or the loss of topsoil.

Soil erosion, which is discussed in detail in *Section 4.9, Hydrology and Water Quality*, of this EIR, could occur during project grading and construction. As described in Section 4.9, compliance with the State Water Resources Control Board's Construction General Permit, including the preparation

and implementation of a Stormwater Pollution Prevention Plan, would ensure that the project would result in less-than-significant impacts related to erosion or loss of topsoil during construction.

Implementation of the requirements of the Belvedere Municipal Code, including Section 16.15.060 which requires the preparation and implementation of erosion control plans, would further reduce the potential for erosion or loss of topsoil to occur during project grading and construction.

After construction is completed, the project site would be restored to existing conditions, in which surfaces are covered with riprap, pavement, and landscaping, which would minimize the potential for post-construction erosion. Therefore, compliance with the Construction General Permit and implementation of Municipal Code requirements would ensure that potential impacts related to erosion or loss of topsoil would be less than significant.

Subsidence/Collapse

The project would not result in on-site or off-site subsidence or collapse.

Subsidence or collapse can result from the removal of subsurface water. Groundwater dewatering is not anticipated to be required for the proposed project; however, if construction-related dewatering would be required, it would be temporary, limited to shallow groundwater, and localized in the areas of excavations. Therefore, potential impacts related to subsidence/collapse would be less than significant.

Expansive Soils

The project would not result in substantial direct or indirect risks related to expansive soils.

Moderate and highly plastic silts and clays, when located near the ground surface, can exhibit expansive characteristics (shrink-swell) that can be detrimental to structures and flatwork during periods of fluctuating soil moisture content. Previous geotechnical investigations, which included soil borings and soil testing, do not indicate the presence of highly plastic or expansive near-surface soils. The risk of damage due to expansive soils is generally low (Miller Pacific Engineering Group, 2022). Therefore, potential impacts related to expansive soils would be less than significant.

Septic Tanks or Alternative Wastewater Disposal

The project would have no impacts related to use of septic tanks or alternative wastewater disposal systems.

The project would not involve the use of septic tanks or other alternative wastewater disposal systems. Therefore, there would be no impacts related to use of septic tanks or alternative wastewater disposal systems.

Paleontological Resources or Unique Geologic Features

The project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Designated unique geologic features have not been identified in Belvedere. As discussed previously, the artificial fill and Bay Mud that underlie the project site are unlikely to contain unique paleontological resources. Therefore, the project would result in less-than-significant impacts related to unique geologic features or paleontological resources.

Potentially Significant Impacts

Impact GEO-1: The project could result in potential substantial adverse effects on existing critical utilities due to seismic-related ground failure including liquefaction, lateral spreading, and landslides. (PS)

As discussed above, the existing levees of the project site are underlain by materials that may become unstable and deform during an earthquake due to liquefaction, lateral spreading, and slope failure. Under existing conditions, portions of the project site could experience up to 6 inches of total and differential settlement and lateral deformations of several feet due to seismically induced liquefaction and lateral spreading. Seismically induced slope failures could also lead to vertical deformations of 6 to 12 inches and lateral deformations of 1 to 4 feet. As part of the proposed project, sheet piles would be installed along the existing levees to reduce vertical and lateral deformations in areas where excessive deformations are predicted during strong seismic shaking. Therefore, in general, the project would improve the stability of the existing levees within the project site, and this is considered a beneficial effect because the project would reduce the potential for lateral spreading and slope failure to cause damage to the levees and improvements along the levees including roadways, pedestrian paths/sidewalks, and utilities.

One of the primary project goals is to limit damage to critical utilities (i.e., water) and maintain road accessibility during and following a strong seismic event. The Geotechnical Investigation (Miller Pacific Engineering Group, 2022) indicates that because the water lines are constructed with steel pipe, displacements of up to 12 inches were considered the maximum design average displacement to limit breakage of the pipe. For San Rafael Avenue the slope stability analysis presented in the Geotechnical Investigation indicates that the estimated seismically induced lateral displacements beyond the northern and southern ends of the proposed sheet piles along the San Rafael segment would be less than 12 inches under existing conditions. With the recommended installation of sheet piles along the San Rafael Avenue segment, the estimated seismically induced deformations would be less than 12 inches along the entire length of the San Rafael Avenue levee. For the Beach Road segment of the project, the slope stability analysis presented in the Geotechnical Investigation indicates that the estimated seismically induced lateral displacements would be approximately 59 inches at the east end of the Beach Road segment and approximately 43 inches at the west end of the Beach Road segment under existing conditions. With the recommended installation of sheet piles along the Beach Road segment, the estimated seismically induced deformations would be 12 inches or less along the length of the Beach Road segment where sheet piles would be installed.

The proposed design of the project does not include ground stabilization measures beyond the ends of the proposed sheet piles. This could create locations near the east and west ends of the proposed sheet piles on the Beach Road segment where there could be a sudden change in seismically induced lateral displacements over a short distance, as the stability of the geologic materials adjacent to the sheet piles would be improved and supported (relative to existing conditions), and the geologic materials just beyond the sheet piles would not be strengthened. This

interface could cause increased differential movement/displacement (i.e., little movement next to the sheet pile and greater movement beyond the support of the sheet pile) that could adversely affect subsurface utilities.

The Geotechnical Investigation (Miller Pacific Engineering Group, 2022) recommended that flexible joints be added to water lines to reduce potential for pipe breakage. As described in *Chapter 3, Project Description*, of this EIR, City staff is recommending that utility providers install flexible utility couplings to make their mainlines more resilient in the event of earthquakes. Such utility couplings would be needed for water, wastewater, and gas lines. Electric and communication (Comcast and AT&T) lines are installed in flexible polyvinyl chloride (PVC) conduits and are generally more resilient toward lateral shifts and movement. It should be noted that these utility improvements are not currently part of the project as utility lines are owned by others, and, as such, these improvements would be completed by entities outside of the City of Belvedere. For example, water lines would need to be improved by Marin Municipal Water District (MMWD) and wastewater lines would need to be improved by Sanitary District No. 5. Pacific Gas & Electric Company (PG&E) would improve gas lines.

The potential for the project to exacerbate conditions related to differential ground displacement and adversely affect existing critical utilities is considered a potentially significant impact, requiring mitigation.

> *Mitigation Measure GEO-1: City of Belvedere staff shall work with utility agencies to find an effective means to install flexible utility connections on utilities that have non-flexible pipes (including water, wastewater, and gas lines) that are located near the eastern and western ends of the proposed sheet piles along Beach Road and new utility laterals that would cross the proposed sheet piles along Beach Road to ensure that utilities would be capable of withstanding expected ground movements during seismic events and future settlement. The City shall retain a qualified geotechnical engineer to assist in the design of the improved utility connections. The installation of the new flexible connections shall occur prior to the conclusion of construction. (LTS)*

Impact GEO-2: The project could result in potential impacts on existing utilities and other improvements due to vibration-induced settlement of unstable soil during sheet pile installation. (PS)

The installation of sheet piles using vibratory or impact hammer methods could result in localized settlement of soil near the sheet piles due to consolidation of loose soils by subsurface vibrations. Such settlement would be most pronounced adjacent to the sheet piles, and the amount of settlement would decrease with distance from the sheet piles. The amount of settlement would depend on soil conditions and the sheet pile installation methods and depths. Installation of sheet piles would occur near existing improvements including structures, utilities, sidewalks, and streets that could be adversely affected by settlement. The repair/replacement of street and sidewalk surfaces adjacent to the proposed sheet piles is already anticipated to be required as part of the proposed project, and therefore potential settlement-induced damage to street or sidewalk surfaces would not be a significant impact. The structures located near the proposed sheet piles are generally supported on deep foundations and localized settlement of soil due to vibrations from sheet pile installation would generally not be expected to affect the integrity of structures on deep foundations; however, depending on the integrity of existing foundation features, surrounding and

underlying soil types, depth of the proposed sheet piles versus the depth of the foundations, and proximity of the proposed sheet piles to the foundation features, it is possible that vibration-induced settlement could affect existing structures. There are existing utilities and other improvements such as fences, walls, guardrails, walkways, and patios that are located in close proximity to proposed sheet piles and that could also be adversely affected by vibration-induced settlement.

The potential for the project to damage existing improvements due to vibration-induced settlement is considered a potentially significant impact, requiring mitigation. Implementation of Mitigation Measure GEO-2 below would ensure that this potential impact would be less than significant.

> *Mitigation Measure GEO-2: A geotechnical report shall be prepared by a qualified geotechnical engineer and shall evaluate the potential for vibration-induced settlement from proposed sheet pile installation and the potential for damage to existing improvements (e.g., structures, utilities, fences, walls, guardrails, walkways, and patios) from vibration-induced settlement. If the geotechnical report identifies existing improvements that could potentially be damaged by vibration-induced settlement, a preconstruction survey of the potentially affected improvements shall be performed, allowable settlement amounts shall be estimated for the potentially affected improvements, and the allowable settlement amounts shall account for estimated future settlement amounts that are expected to occur due to the construction of the existing levees and placement of fill materials that previously occurred in the project area. Settlement monitoring shall be performed during construction activities. If the geotechnical report identifies any existing improvements that are very likely to experience damage due to vibration-induced settlement, measures shall be implemented to prevent such damage prior to the start of sheet pile installation near the existing improvements. Such measures may include relocation of utilities, installation of flexible connections on utilities, temporary shoring/bracing of the existing improvements, or use of alternative methods for sheet pile installation near the existing improvements, such as use of a silent pile driver.*
>
> *If settlement monitoring indicates that construction activities have caused unacceptable levels of settlement or observable damage to existing improvements, or that construction activities would be expected to cause unacceptable levels of settlement if construction activities continue using the same methods, the vibration-causing activities shall cease and measures shall be implemented to prevent further settlement or damage to existing improvements. Such measures may include relocation of utilities, installation of flexible connections on utilities, temporary shoring/bracing of existing improvements, or use of alternative methods for sheet pile installation such as use of a silent pile driver. If any damage is caused to existing improvements as a result of vibration-induced settlement during sheet pile installation, the City of Belvedere shall repair the damage following the completion of project construction activities near the area of damage. (LTS)*

Cumulative Impacts

A cumulative impact is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Potential impacts related to geology and soils generally do not extend far beyond an individual project's boundaries because each project location may have unique geologic considerations. Therefore, the potential for cumulative impacts related to geology and soils is generally limited to a project site and adjacent sites. For this reason, potential impacts are typically confined to discrete spatial locations and do not combine with projects in different locations to create a significant cumulative impact. The exception to this generalization would be larger-scale geologic events, such as a large landslide or regional subsidence, that might affect an extensive area. For geology and soils, the cumulative impact area considered is the project site and adjacent areas.

Impact GEO-3: Past, present, and reasonably foreseeable future projects, which include placement of loads over a geologic unit that is unstable and could result in settlement, could combine with the project to cause a cumulative adverse effect on existing Improvements. (PS)

Past actions, including the original construction of two "land bridges" in the 1940s that were converted into San Rafael Avenue and Beach Road, required the placement of artificial fill loads over compressible Bay Mud. This past fill placement initiated a slow process of settlement. The Geotechnical Investigation indicates that the settlement from this past project is ongoing, though almost complete. It is reasonably foreseeable that flood barriers, such as walls and similar features to protect against flooding and sea level rise (see description of the Flood Barrier Project in *Chapter 6, Other CEQA Considerations*, of this EIR), would be constructed within or adjacent to the project site in the future. Such flood barriers would place new loads along San Rafael Avenue and Beach Road and would initiate a new phase of settlement that could adversely affect existing improvements and proposed improvements such as the new utility laterals that would be installed through the proposed sheet piles on Beach Road. Implementation of Mitigation Measure GEO-1 would include the installation of flexible connections on new utility laterals which would ensure that potential settlement from future flood barriers would not damage the new utility laterals. As discussed under Impact GEO-2 above, vibration-induced settlement from the proposed sheet pile installation activities could also result in settlement that could adversely affect existing improvements; however, implementation of Mitigation Measure GEO-2 would reduce such impacts from the project to a less than cumulatively considerable level. The reasonably foreseeable Flood Barrier Project would be required to undergo future environmental review under CEQA, which would ensure that potential settlement related impacts of the flood barrier project would be mitigated, if necessary.

Therefore, with implementation of Mitigation Measures GEO-1 and GEO-2, the potential for the project to result in a cumulatively considerable contribution to settlement is considered a less-than-significant impact.

> *Mitigation Measure GEO-3: Implement Mitigation Measures GEO-1 and GEO-2.*
>
> *Implementation of these measures would reduce the project's contribution to the cumulative impact to less than significant. (LTS)*

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4.7 GREENHOUSE GAS EMISSIONS

INTRODUCTION

This section describes existing greenhouse gas (GHG) emissions within Belvedere and the San Francisco Bay Area Air Basin (SFBAAB), discusses the regulations and policies pertinent to GHG emissions, and assesses the potentially significant impacts that could result from implementation of the project.

ENVIRONMENTAL SETTING

Climate Change and GHG Emissions

Climate change refers to changes in the Earth's weather patterns, including the rise in temperature due to an increase in heat-trapping GHGs in the atmosphere. Existing GHGs allow about two-thirds of the visible and ultraviolet light from the sun to pass through the atmosphere and be absorbed by the Earth's surface. To balance the absorbed incoming energy, the surface radiates thermal energy back to space at longer wavelengths primarily in the infrared part of the spectrum. Much of the thermal radiation emitted from the surface is absorbed by the GHGs in the atmosphere and is re-radiated in all directions. Since part of the re-radiation is back toward the surface and the lower atmosphere, the global surface temperatures are elevated above what they would be in the absence of GHGs. This process of trapping heat in the lower atmosphere is known as the greenhouse effect.

An increase of GHGs in the atmosphere affects the energy balance of the Earth and results in a global warming trend. Increases in global average temperatures have been observed since the mid-20th century and have been linked to observed increases in GHG emissions from anthropogenic sources. The primary GHG emissions of concern are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Other GHGs of concern include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6), but their contribution to climate change is less than 1 percent of the total GHGs that are well-mixed (i.e., that have atmospheric lifetimes long enough to be homogeneously mixed in the troposphere) (IPCC, 2013). Each GHG has a different global warming potential. For instance, CH_4 traps about 28 times more heat per molecule than CO_2 (IPCC, 2014). As a result, emissions of GHGs are reported in metric tons of carbon dioxide equivalents (CO_2e), wherein each GHG is weighted by its global warming potential relative to CO_2.

Ice-core records of historical atmospheric CO_2 concentrations, which currently extend back about 800,000 years, indicate that CO_2 concentrations naturally fluctuate between glacial and interglacial periods. According to the Intergovernmental Panel on Climate Change (IPCC), over the past few hundred years the atmospheric concentrations of CO_2 have increased to unprecedented levels compared to previous fluctuations in CO_2 concentrations observed over the past 800,000 years due to anthropogenic sources. In 2011, concentrations of CO_2, CH_4, and N_2O exceeded the pre-industrial era (before 1750) by about 40, 150, and 20 percent, respectively (BAAQMD, 2015).

Based on measurements of the Earth's global average surface temperature, eight of the top 10 warmest years on record since 1880 have occurred in the last decade (NASA, 2022).

The global increases in CO_2 concentration are due primarily to fossil fuel combustion and land use change (e.g., deforestation). The dominant anthropogenic sources of CH_4 are from ruminant livestock, fossil fuel extraction and use, rice paddy agriculture, and landfills, while the dominant anthropogenic sources of N_2O are from ammonia for fertilizer and industrial activity. Emissions of HFCs, PFCs, and SF_6 are not naturally occurring; they originate from industrial processes such as semiconductor manufacturing, their use as refrigerants and other products, and electric power transmission and distribution (BAAQMD, 2015).

Existing GHG Emission and Projections

The California Air Resources Board (CARB) estimated that, in 2019, transportation was responsible for about 40 percent of California's GHG emissions, followed by industrial sources and electrical power generation at about 21 percent and 14 percent, respectively (CARB, 2021). In 2015, 85 million metric tons of CO_2e were emitted from anthropogenic sources within the SFBAAB. Emissions of CO_2 dominate the GHG inventory in the SFBAAB, accounting for about 90 percent of the total CO_2e emissions reported (BAAQMD, 2017). The 2015 GHG emissions in the SFBAAB are summarized in Table 4.7-1.

TABLE 4.7-1 SAN FRANCISCO BAY AREA 2015 GREENHOUSE GAS EMISSIONS INVENTORY

Pollutant	Percent	CO_2e (MMT/Year)
CO_2	90	76.5
CH_4	4	3.4
N_20	2	1.7
HFC, PFC, SF_6	4	3.4
Total	100	85

Note: CO_2e = carbon dioxide equivalents, MMT = million metric tons
Source: Bay Area Air Quality Management District (BAAQMD), 2017.

The City of Belvedere's GHG emissions inventories for the years 2005 and 2019 (which is the most recent year of data available) are summarized in Table 4.7-2 for various land use sectors. As shown in Table 4.7-2, GHG emissions dropped from about 14,855 metric tons carbon dioxide equivalents ($MTCO_2e$) in 2005 to 10,935 $MTCO_2e$ in 2019, which is a 26 percent reduction. While emissions declined in almost all sectors, the largest reductions were due to reduction in the carbon intensity of electricity, improvements in energy conservation and efficiency, and improvements to vehicle fuel efficiency.

TABLE 4.7-2 BELVEDERE COMMUNITY GREENHOUSE GAS EMISSIONS SUMMARY BY SECTOR (METRIC TONS CARBON DIOXIDE EQUIVALENTS [$MTCO_2E$])

Sector	2005	2019
Built Environment – Electricity	2,512	817
Built Environment – Natural Gas	5,559	4,987
Transportation	5,707	4,480
Waste	699	469
Off-Road	212	131
Water	87	3
Wastewater	79	48
Total	14,855	10,935
Reduction from 2005 by 2019		26%

Source: City of Belvedere, 2022.

Effects of GHG Emissions

According to the Bay Area Air Quality Management District (BAAQMD), some of the potential effects of increased GHG emissions and associated climate change may include loss of snowpack (affecting water supply), more frequent extreme weather events, more frequent large forest fires, more frequent drought years, and sea level rise. In addition, climate change may increase electricity demand for cooling, decrease the availability of hydroelectric power, and affect regional air quality and public health (BAAQMD, 2017).

In October 2018, the IPCC published a special report on potential long-term climate change impacts based on the projected increases in temperature due to global climate change. The IPCC report found that the Earth is already seeing the consequences of global warming due to a 1 degree Celsius (°C) increase in pre-industrial levels, such as extreme weather, rising sea levels, and diminishing Arctic sea ice. Global warming is likely to reach 1.5°C above pre-industrial levels between 2030 and 2050 if it continues to increase at the current rate. Some of the impacts due to ongoing global warming could be avoided by limiting future global warming to 1.5°C compared to 2°C. For example, by limiting global warming to 1.5°C or lower, the likelihood of an Arctic Ocean free of sea ice in summer would be ten times lower compared to the likelihood under the scenario of 2°C increase. Beyond the 1.5°C threshold, there would be significant increases in the risk associated with long-lasting or irreversible changes, such as the loss of ecosystems. The IPCC states that to limit the global warming to 1.5°C, rapid transitions are needed in land, energy, industry, building, transport, and urban sectors to reach the goal of carbon neutrality by 2050, which means that the Earth's anthropogenic GHG emissions each year would be removed completely through carbon offsetting, sequestration, or other means (IPCC, 2018).

REGULATORY FRAMEWORK

Federal Regulations

Federal Climate Action Goals

The United States (U.S.) participates in the United Nations Framework Convention on Climate Change. In 1998, the U.S. signed the Kyoto Protocol, which would have required reductions in GHGs; however, the protocol did not become binding in the U.S. as it was never ratified by Congress. Instead, the federal government chose voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science. In 2002, the U.S. announced a strategy to reduce the GHG intensity of the American economy by 18 percent over a 10-year period from 2002 to 2012. In 2015, the U.S. submitted its "intended nationally determined contribution" to the framework convention, which targets to cut net GHG emissions by 26 to 28 percent below 2005 levels by 2025.

The U.S. Environmental Protection Agency (EPA) is responsible for enforcing the federal Clean Air Act and the 1990 amendments to it. On April 2, 2007, the U.S. Supreme Court ruled that CO_2 is an air pollutant as defined under the Clean Air Act, and that the EPA has the authority to regulate emissions of GHGs (U.S. Supreme Court, 2007).

The EPA made two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act, as follows:

- Endangerment Finding: The current and projected concentrations of the six key well-mixed GHGs (CO_2, CH4, N2O, HFCs, PFCs, and SF6) in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, they were a prerequisite for implementing GHG emissions standards for vehicles.

Federal Vehicle Emission Regulations

The EPA has established national GHG emission and fuel economy regulations for vehicles that would achieve substantial GHG emissions reductions along with reductions in other criteria pollutants. Some of the key EPA regulations related to GHG emissions from vehicles are as follows:

- In May 2010, the EPA in collaboration with the National Highway Traffic Safety Administration (NHTSA) finalized national GHG emission and fuel economy standards for light-duty vehicles for the model years 2012 to 2016.
- In 2012, the EPA and NHTSA extended the Corporate Average Fuel Economy (CAFE) and GHG emissions standards for light-duty vehicles for model years 2017 to 2025. Combined with the 2012 to 2016 standards, the regulation will result in vehicles emitting 50 percent less than 2010 levels in 2025.

- In 2016, the EPA and NHTSA finalized national GHG emission and fuel economy standards for medium- and heavy-duty vehicles that would cover model years 2018 to 2027 for certain trailers and model years 2021 to 2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks.
- In 2020, the EPA and NHSTA finalized updated CAFE and GHG emissions standards for passenger cars and light trucks and established new standards, covering model years 2021 through 2026.
- In 2021, the EPA revised the GHG emissions standards for passenger cars and light trucks for model years 2023 through 2026 to leverage advances in clean car technology.
- In 2022, the NHTSA revised the CAFE standards for passenger cars and light trucks for model years 2024 to 2026, which are expected to result in average fuel economy label values of 49 miles per gallon.

State Regulations

The State of California has set ambitious GHG emission reduction targets for the next 30 years. As described below, the state has implemented a range of regulatory programs to help achieve statewide climate action goals.

California Climate Action Goals

The State of California has established the following long-term climate action goals:

- Assembly Bill (AB) 32: Reduce GHG emissions to 1990 levels by 2020.
- Senate Bill (SB) 32: Reduce GHG emissions to 40 percent below 1990 levels by 2030.
- Executive Order B-55-18: Achieve carbon neutrality as soon as possible, but no later than 2045.
- Executive Order S-3-05: Reduce GHG emissions to 80 percent below 1990 levels by 2050.
- AB 1279: Achieve carbon neutrality as soon as possible, and no later than 2045, and 85 percent emissions reduction.

It should be noted that executive orders are legally binding only on state agencies and have no direct effect on local government or the private sector.

California Vehicle Emission Regulations

The State of California has established statewide GHG emission and fuel economy regulations for vehicles that align with or supersede the national standards. The key state regulations related to GHG emissions from vehicles are as follows:

- The Pavley Regulations (AB 1493), as amended in 2009, required a 30 percent reduction in state GHG emissions from new passenger vehicles from 2009 through 2016.
- The Advanced Clean Cars Program extends the Pavley Regulations beyond 2016 and established a technology mandate for zero-emission vehicles.

- The Low-Carbon Fuel Standard (Executive Order S-1-07), as amended in 2019, requires a 20 percent reduction in the carbon intensity of California's transportation fuels by 2030.
- SB 375 establishes regional GHG reduction targets for passenger vehicles for the years 2020 and 2035 by requiring metropolitan planning organizations (MPOs) to develop and implement Sustainable Communities Strategies that align regional transportation planning efforts with regional housing allocation needs.

California Energy Efficiency Regulations

The State of California has established statewide energy efficiency regulations, including programs that increase the statewide procurement of renewable energy. The key state regulations related to GHG emissions from energy use are as follows:

- The Renewable Portfolio Standard Program, as updated in 2018 (SB 100), requires the state to procure 60 percent of its electricity from renewable sources by 2030 and 100 percent from carbon-free sources by 2045.
- Title 24 Building Efficiency Standards are updated every 3 years with the long-term vision to support zero-net energy for all new single-family and low-rise residential buildings by 2020 and new high-rise residential and non-residential buildings by 2030.
- Title 24 California Green Building Standards, referred to as the CALGreen Code, aim to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories: (1) planning and design, (2) energy efficiency, (3) water efficiency and conservation, (4) material conservation and resource efficiency, and (5) environmental air quality.

California Cap-and-Trade Program

The Cap-and-Trade Program is a key element of the state's strategy to reduce GHG emissions from covered entities[1] that are responsible for about 85 percent of California's GHG emissions. The program establishes a declining limit on major sources of GHG emissions throughout California, and it creates a powerful economic incentive for significant investment in cleaner and more efficient technologies. CARB creates allowances equal to the total amount of permissible GHG emissions (i.e., the "cap"). Each year, fewer allowances are created and the annual cap declines. As a result, the annual auction reserve price for allowances increases, which creates a steady and sustained carbon price signal to incentivize actions to reduce GHG emissions and enable a smooth transition to a cleaner economy.

California's Short-Lived Climate Pollutant Reduction Strategy

The Short-Lived Climate Pollutant (SLCP) Reduction Strategy is California's plan for reducing emissions of high global-warming potential gases with short atmospheric lifetimes (CARB, 2017a). SLCPs include methane, HFCs, and anthropogenic black carbon. In accordance with SB 1383, the SLCP Reduction Strategy has set the following targets for statewide reductions in SLCP emissions:

[1] The program's covered entities include electric power plants, fuel distributors (natural gas and petroleum), and large industrial facilities that emit more than 25,000 million tons of CO_2e per year.

- 40 percent below 2013 levels by 2030 for methane and HFCs.
- 50 percent below 2013 levels by 2030 for anthropogenic black carbon.

The SLCP Reduction Strategy also provides specific direction for reductions from dairy and livestock operations and from landfills by diverting organic materials.

California's Climate Change Scoping Plan

In December 2008, CARB adopted the Climate Change Scoping Plan to identify how the state can achieve its 2020 climate action goal under AB 32. In 2017, CARB updated the Scoping Plan to identify how the state can achieve its 2030 climate action goal under SB 32, and substantially advance toward its 2050 climate action goal under Executive Order S-3-05. The 2017 Scoping Plan includes the regulatory programs identified above, such as the Advanced Clean Cars Program, Low-Carbon Fuel Standard, Renewable Portfolio Standard Program, energy efficiency standards, SLCP Reduction Strategy, and Cap-and-Trade Program (CARB, 2017b). In May 2022, CARB released the Draft Environmental Analysis for the Draft 2022 Scoping Plan Update for public review (CARB, 2022).

Local Regulations and Policies

The BAAQMD is the regional government agency that regulates sources of GHG emissions within the SFBAAB. The BAAQMD established a climate protection program that includes measures that promote energy efficiency, reduce regional vehicle miles traveled (VMT), and develop alternative sources of energy, all of which assist in reducing emissions of GHGs and in reducing air pollutants that affect the health of residents. The BAAQMD also seeks to support current climate protection programs in the region and to stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders.

BAAQMD 2017 Clean Air Plan

The BAAQMD and other air districts prepare clean air plans in accordance with the state and federal Clean Air Acts. In April 2017, the BAAQMD adopted the 2017 Clean Air Plan (*Spare the Air, Cool the Climate*), which is a comprehensive plan to improve Bay Area air quality and protect public health through implementation of a control strategy designed to reduce emissions and ambient concentrations of harmful pollutants. The 2017 Clean Air Plan also includes measures designed to reduce GHG emissions.

City of Belvedere Climate Action Plan

On June 13, 2022, the City of Belvedere adopted the Climate Action Plan 2030 (CAP 2030), which is an update to the Belvedere Climate Action Plan 2011, to set out a road map to achieve the SB 32 GHG emission reduction goals. The CAP 2030 reports on existing actions and recommends future potential strategies that the City may take to address the local consequences of climate change. The CAP 2030 identified local GHG reduction strategies that the City can use to meet the state's goals to reduce overall GHG emissions to 40 percent below 1990 levels by 2030 related to the following:

- Low Carbon Transportation
- Renewable Energy and Electrification
- Energy Efficiency
- Waste Reduction
- Water Conservation
- Sequestration and Adaptation
- Community Engagement
- Implementation and Monitoring

City of Belvedere General Plan

The City's General Plan (City of Belvedere, 2010) includes the following policies that would apply to construction of the proposed project and were adopted for the purpose of avoiding or mitigating an environmental impact as related to GHG emissions:

Policy SUST-7.3	Implement circulation improvements that reduce vehicle idling.
Action SUST-7.3.1	Enforce State idling laws for commercial vehicles, including delivery and construction vehicles.
Policy SUST-7.4	Minimize single-occupant vehicles and reduce congestion.
Action SUST-7.4.5	Require carpooling and shuttles for employees of larger construction projects.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Significance Criteria

In accordance with California Environmental Quality Act (CEQA) Guidelines Appendix G, implementation of the proposed project would result in a significant GHG impact if it would:

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
2. Fundamentally conflict with an applicable plan, policy, or regulation adopted for the purposes of reducing the emissions of GHGs.

Less-than-Significant Impacts

Generation of GHG Emissions

The project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

Construction activities would generate GHG emissions from several sources, such as the operation of on-site heavy construction equipment and off-site construction vehicle trips, vendor vehicle trips, and worker commute trips. The BAAQMD does not recommend a threshold of significance for GHG emissions during construction because there is not sufficient evidence to determine a level at which temporary construction emissions are significant. A construction contractor would have no

incentive to waste fuel during construction, however, and therefore it is generally assumed that GHG emissions during construction would be minimized to the maximum extent feasible. During construction, the construction workers would be required to park their personal vehicles outside the City of Belvedere and be transported to and from the construction area via contractor-supplied vans or buses, reducing construction-related VMT and congestion on local roadways. This is consistent with CAP 2030 GHG reduction measure LCT-6 Employee and Construction Trip Reduction and General Plan Action SUST-7.4.5. Furthermore, General Plan Policy SUST-7.3 requires the enforcement of state idling laws for commercial vehicles, including delivery and construction vehicles, which would reduce vehicle idling emissions from diesel-fueled vehicles. Therefore, GHG emissions from construction of the project would have a less-than-significant impact on the environment.

Once constructed, the project would not result in new GHG emissions during operation. Therefore, there would be no GHG emissions impact related to operation of the proposed project.

Conflict with Applicable Plans, Policies, or Regulations

The project would not conflict with an applicable plan, policy, or regulation adopted for the purposes of reducing the emissions of GHGs.

As discussed above, the project would be consistent with the applicable City Climate Action Plan and General Plan measures and policies. Consistency with the City's Climate Action Plan, which set out a road map to meet the state's goal of reducing overall GHG emissions to 40 percent below 1990 levels by 2030, would ensure the project would not conflict with the CARB Scoping Plan. Therefore, the project's potential for conflict with applicable plans, policies, or regulations is considered less than significant.

Potentially Significant Impacts

The project would not have any potentially significant impacts related to GHG emissions.

Cumulative Impacts

As discussed above, GHG impacts are, by their nature, cumulative impacts because one project by itself cannot significantly contribute to or cause significant environmental effects related to GHG emissions. The proposed project would not result in or contribute to any significant cumulative GHG impacts because it would not generate GHG emissions that may have a significant impact on the environment or fundamentally conflict with the CARB Scoping Plan and the City's Climate Action Plan or General Plan.

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4.8 HAZARDS AND HAZARDOUS MATERIALS

INTRODUCTION

This section of the Draft Environmental Impact Report (EIR) provides an overview of potential hazards and hazardous materials at and near the project site and assesses potential impacts related to hazards and hazardous materials that could result from implementation of the proposed Belvedere Seismic Upgrade Project (project or BUSP).

ENVIRONMENTAL SETTING

This section describes the existing conditions related to hazards and hazardous materials near the project site including soil conditions, hazardous materials release sites, airports, emergency evacuation/response plans, and wildfire conditions.

Soil Conditions

The project area was created in the mid to late 1940s by construction of dikes at Beach Road and San Rafael Avenue and draining of the original interior lagoon. Native soils were then excavated from the lagoon area and placed as fill to form elevated streets and building pads (City of Belvedere, 2010). Based on the native source of soil used to construct the area, hazardous materials contamination is not expected to be present in soil at the project site. No environmental investigations of soil quality have been conducted for the project site because the existing uses as levees, pedestrian walkways, and streets and adjacent uses as residential properties do not involve hazardous materials use or storage that would normally warrant such investigation.

Hazardous Materials Release Sites

Regulatory agency databases maintained by the State Water Resources Control Board (State Water Board) and Department of Toxic Substances Control (DTSC) were reviewed to evaluate the potential for hazardous materials releases in the vicinity of the project site. Based on review of DTSC's EnviroStor database (DTSC, 2022) and the State Water Board's GeoTracker database (State Water Board, 2022), hazardous materials release sites were not identified at or adjacent to the project site (including proposed project staging areas). The nearest identified hazardous materials release sites are as follows (State Water Board, 2022):

- A closed leaking underground storage tank (LUST) site located at 140 Bella Vista Avenue, approximately 600 feet southwest of the limit of work for the Beach Road segment of the project site;
- A closed LUST site located at 1600 Tiburon Boulevard, approximately 300 feet northeast of the limit of work for the Beach Road segment of the project site;
- A closed LUST site located at 1515 Tiburon Boulevard, approximately 600 feet southeast of the proposed staging area at the City Corporation Yard and approximately 900 feet north of the limit of work for the Beach Road segment of the project site; and

- A closed LUST site located at 1660 Tiburon Boulevard, approximately 600 feet east of the limit of work for the Beach Road segment of the project site.

Based on the closed case status of these LUST cases and their distances from various areas of the project site, these LUST cases would not be expected to affect the environmental condition of the project site.

Airports

The project site is located approximately 15 miles northwest of the Oakland International Airport, which is the nearest public airport. The project site is not located within a public airport land use plan area or within 2 miles of a public use airport (Alameda County Community Development Agency, 2010).

Wildfire Conditions

The project site is in a highly urbanized area and is not located within or near a State Responsibility Area or a Very High Fire Hazard Severity Zone as mapped by the California Department of Forestry and Fire Protection (CAL FIRE, 2008). The Tiburon Fire Protection District provides fire protection and emergency medical services for the City of Belvedere. The project site is not in or near a Wildland-Urban Interface area mapped by the Tiburon Fire Protection District (Tiburon Fire Protection District, 2022). Although Belvedere is not adjacent to wildlands and therefore is not within a designated Wildlands-Urban Interface area, fire hazards are a concern in the city. The fire hazards are caused in part by the large number of eucalyptus trees, which have highly flammable wood and tree litter. There are also steeply sloping lots that grow wild and contain flammable debris and brush. Houses with wooden roofs and decks built close together also contribute to the fire hazard potential. The extremely narrow and winding streets on Belvedere Island and Corinthian Island are also an impediment to quick response by the Tiburon Fire Protection District (City of Belvedere, 2010).

Emergency Evacuation and Response

The City's General Plan (City of Belvedere, 2010) includes a Conceptual Evacuation Map that was developed by the Tiburon Fire Protection District to be used in its present form or with possible future modifications to direct residents to evacuate during a fire emergency. The General Plan indicates that it is likely that residents would be asked to evacuate on foot to identified staging areas to reduce congestion on roadways that may obstruct emergency responders and other evacuees; and that in the case of a tsunami, residents would be asked to evacuate to the highest ground available.

As shown in Figure 4.8-1, the Conceptual Evacuation Map identifies most of the roadways in Belvedere as evacuation routes and splits the city into three evacuation route areas:

- Evacuation Route A includes most of the roadways and many of the pedestrian paths in the southern portion of Belvedere Island, Peninsula Road within Belvedere Lagoon, and Beach Road. This route directs the flow of evacuees toward Beach Road and Evacuation Area A located at the San Francisco Yacht Club parking lot and western dock area on Beach Road.

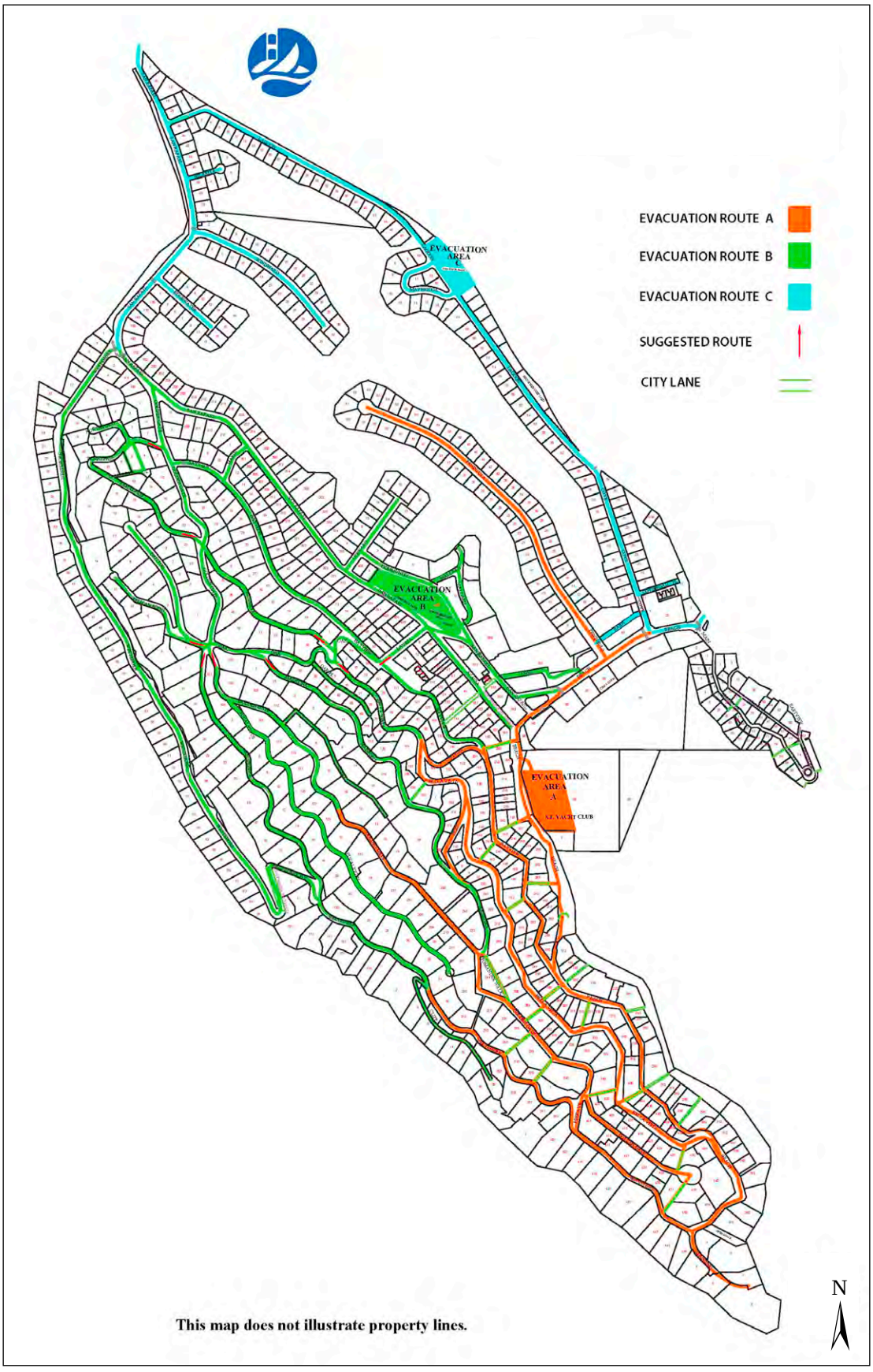

Figure 4.8-1

EVACUATION ROUTES

SOURCE: City of Belvedere General Plan, 2010

- Evacuation Route B includes most of the roadways in the central and northern portions of Belvedere Island and west side of Belvedere Lagoon. This route directs the flow of evacuees toward San Rafael Avenue and Evacuation Area B located at the community park on San Rafael Avenue. Belvedere Way is a designated evacuation route in Evacuation Area B. It connects from the southern end of West Shore Road to Belvedere Avenue. Belvedere Way is the only access point to West Shore Road other than the northern entrance to West Shore Road from San Rafael Avenue. The lower segment of Belvedere Way is a pedestrian lane that is not passable by vehicle.
- Evacuation Route C covers the areas surrounding the east and north sides of the Belvedere Lagoon. This route directs the flow of evacuees toward San Rafael Avenue, Lagoon Road, and Evacuation Area C located at Tom Price Park on Lagoon Road.

San Rafael Avenue and Beach Road are two of the most critical emergency evacuation/response routes in Belvedere. Most of the city's roadways feed into these two streets, and they are the only roadways that provide access between Tiburon (where emergency response services would be coming from) and Belvedere Island and much of the Belvedere Lagoon. Evacuation and emergency response to natural disasters, fires, and other emergencies would require access along both San Rafael Avenue and Beach Road in both directions—that is, both for emergency vehicles traveling to the area and for residents and others evacuating from the area.

REGULATORY FRAMEWORK

This section describes the federal, state, regional, and local regulatory framework for hazardous materials and worker health and safety requirements.

Federal and State Regulations

Environmental Protection Agency (EPA)

The United Sates Environmental Protection Agency (EPA) is the federal agency responsible for enforcement and implementation of federal laws and regulations pertaining to hazardous materials and hazardous waste. The federal regulations are primarily codified in Title 40 of the Code of Federal Regulations. The legislation includes the Resource Conservation and Recovery Act (RCRA) of 1976, the Superfund Amendments and Reauthorization Acts of 1986, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, and the Toxic Substances Control Act of 1976 (TSCA). The EPA provides oversight for site investigation and remediation projects, and has developed protocols for sampling, testing, and evaluation of solid wastes.

Resource Conservation and Recovery Act (RCRA)

The Resource Conservation and Recovery Act (RCRA) is a combination of the first federal solid waste statutes and all subsequent amendments mandated by Congress. RCRA establishes the framework for a national system of solid waste control. Subtitle D of RCRA is dedicated to non-hazardous solid waste requirements, and Subtitle C focuses on hazardous solid waste. Solid waste includes solids, liquids, and gases and must be discarded to be considered waste. Under Subtitle C of RCRA, EPA has developed a comprehensive program to ensure that hazardous waste is

managed safely from the moment it is generated to its final disposal (cradle-to-grave) and may authorize states to implement key provisions of hazardous waste requirements in lieu of the federal government. If a state program does not exist, EPA directly implements the hazardous waste requirements in that state. Subtitle C regulations set criteria for hazardous waste generators, transporters, and treatment, storage, and disposal facilities. This includes permitting requirements, enforcement, and corrective action or cleanup.

Hazardous Materials Transportation Act (HMTA)

The federal Hazardous Materials Transportation Act (HMTA) of 1975 is the statutory basis for the extensive body of regulations aimed at ensuring the safe transport of hazardous materials on water, rail, and highways and through air or pipelines. It includes provisions for material classification, packaging, marking, labeling, placarding, and shipping documentation.

United States Department of Transportation (DOT) and State of California Agencies

In 1990 and 1994, the federal HMTA was amended to improve the protection of life, property, and the environment from the inherent risks of transporting hazardous material in all major modes of commerce. The United States Department of Transportation (DOT) developed hazardous materials regulations that govern the classification, packaging, communication, transportation, and handling of hazardous materials, as well as employee training and incident reporting. The transportation of hazardous materials is subject to both RCRA and DOT regulations. The California Highway Patrol, California Department of Transportation (Caltrans), and DTSC are responsible for enforcing federal and state regulations pertaining to the transportation of hazardous materials.

United States Department of Labor Occupational Safety and Health Administration (OSHA)

Worker health and safety are regulated at the federal level by the Occupational Safety and Health Administration (OSHA). The Federal Occupational Safety and Health Act of 1970 authorizes states to establish their own safety and health programs with OSHA approval. Workers at hazardous waste sites (or workers who may be exposed to hazardous wastes that might be encountered during excavation of contaminated soils) must receive specialized training and medical supervision according to the Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations. Additional regulations have been developed for construction workers potentially exposed to lead and asbestos.

State of California Department of Toxic Substances Control (DTSC)

In California, DTSC is authorized by the EPA to enforce and implement federal hazardous materials laws and regulations. State of California regulations pertaining to hazardous materials are as stringent as or more stringent than the federal requirements. Most state hazardous materials regulations are contained in Title 22 of the California Code of Regulations (CCR) (see below). DTSC generally acts as the lead agency for soil and groundwater cleanup projects that have the potential to affect public health and establishes cleanup levels for subsurface contamination that are equal to or more restrictive than federal levels. DTSC has also developed land disposal restrictions and treatment standards for hazardous waste disposal in California.

California Health and Safety Code

Health and Safety Code Division 20, Chapter 6.5 - Hazardous Waste Control, is the primary hazardous waste statute in the State of California and implements RCRA as a "cradle-to-grave" waste management system in California. It specifies that generators have the primary duty to determine whether their wastes are hazardous and to ensure their proper management. It also establishes criteria for the reuse and recycling of hazardous wastes used or reused as raw materials. It exceeds federal requirements by mandating source reduction planning and a much broader requirement for permitting facilities that treat hazardous waste. It also regulates types of wastes and waste management activities that are not covered by federal law under RCRA.

State Water Resources Control Board

Under the Porter-Cologne Water Quality Control Act (California Water Code, Division 7), the State Water Board has authority over State waters and water quality. "Waters of the state" are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (Water Code Section 13050[e]). The State Water Board enforces the Porter-Cologne Water Quality Act through its nine regional boards, including the San Francisco Bay Regional Water Quality Control Board (Regional Water Board), described below. The State Water Board issued the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Associated with Construction Activity (Construction General Permit), Order 2009-0009-DWQ as amended by 2010-0014-DWQ and 2012-006-DWQ, which addresses management of hazardous materials at construction sites that disturb over 1 acre of land (described in detail in *Section 4.9, Hydrology and Water Quality*, of this EIR).

California Code of Regulations (CCR) Title 22

Most state and federal regulations and requirements that apply to generators of hazardous waste are spelled out in California Code of Regulations (CCR) Title 22, Division 4.5. Title 22 contains the detailed compliance requirements for hazardous waste generators, transporters, and treatment, storage, and disposal facilities. Because California is a fully authorized state according to RCRA, most RCRA regulations (those contained in 40 Code of Federal Regulations [CFR] 260 et seq.) have been duplicated and integrated into Title 22. However, because DTSC regulates hazardous waste more stringently than the EPA does, the integration of California and federal hazardous waste regulations that make up Title 22 does not contain as many exemptions or exclusions as does 40 CFR 260. As with the California Health and Safety Code, Title 22 also regulates a wider range of waste types and waste management activities than the RCRA regulations in 40 CFR 260 do. To aid the regulated community, the State of California compiled the hazardous materials, waste, and toxics-related regulations contained in CCR Titles 3, 8, 13, 17, 19, 22, 23, 24, and 27 into one consolidated CCR Title 26, "Toxics." However, the California hazardous waste regulations are still commonly referred to as Title 22.

California Code of Regulations Title 8 and California Division of Occupational Safety and Health (Cal/OSHA)

California standards for workers dealing with hazardous materials are contained in CCR Title 8 and include practices for all industries (General Industrial Safety Orders) and specific practices for construction and other industries. Worker health and safety protections in California are regulated

by the California Department of Industrial Relations, which includes the Division of Occupational Safety and Health (Cal/OSHA), which acts to protect workers from safety hazards and provides consultant assistance to employers. Cal/OSHA enforcement units conduct on-site evaluations and issue notices of violation to enforce necessary improvements to health and safety practices.

Title 8 of the CCR specifically addresses laboratory environments in Article 107 of Group 16 regulations, Sections 5139-5155, *Control of Hazardous Substances*. Subsection 5154.1 discusses requirements for the ventilation of laboratory fumes, including hood design and operation, air volume movement, and exhaust stack design. In addition, circumstances under which air dilution or air cleaning is required (such as scrubbing or air incineration) and decontamination procedures are described.

California Fire Code

The California Fire Code is Part 9 of Title 24, CCR, also referred to as the California Building Standards Code. The California Fire Code incorporates the latest International Fire Code of the International Code Council with necessary California amendments. The purpose of the California Fire Code is to establish the minimum requirements consistent with nationally recognized good practices to safeguard the public health, safety, and general welfare from the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures, and premises; and to provide safety and assistance to firefighters and emergency responders during emergency operations.

California Fire Code Chapter 33 contains requirements for construction activities, including the development and implementation of a site safety plan establishing a fire prevention program. In addition, California Fire Code Chapter 35 contains specific requirements for welding and other hot work under Chapter 35. The requirements are intended to maintain the required levels of fire protection, limit fire ignition and spread, establish the appropriate operation of equipment, and promote prompt response to fire emergencies. Regulated features include fire protection systems, firefighter access, water supply, means of egress, hazardous materials storage and use, and temporary heating equipment and other ignition sources.

California Government Code Section 65962.5

The provisions of Government Code Section 65962.5 require DTSC, the State Water Board, the California Department of Health Services, and the California Department of Resources Recycling and Recovery (formerly the California Integrated Waste Management Board) to submit information pertaining to sites associated with solid waste disposal, hazardous waste disposal, leaking underground storage tank (LUST) sites, and/or hazardous materials releases to the Secretary of California Environmental Protection Agency (Cal/EPA).

Regional and Local Regulations and Policies

San Francisco Bay Regional Water Quality Control Board

The Regional Water Board provides for protection of state waters in accordance with the Porter-Cologne Water Quality Act of 1969. The Regional Water Board can act as lead agency to provide

oversight of sites where the quality of groundwater or surface waters is threatened and has the authority to require investigations and remedial actions.

City of Belvedere General Plan

The City's General Plan (City of Belvedere, 2010) includes the following policies and actions that would apply to the project and were adopted for the purpose of avoiding or mitigating environmental impacts as related to hazards and hazardous materials:

Policy HAZ-1.1 Construction shall be located and designed to avoid or minimize the hazards from earthquake, erosion, landslides, floods, and fire.

Action HAZ-1.1.4 New construction must not compromise public infrastructure which is key to emergency access, egress, and flood prevention.

Policy HAZ-1.3 Maintain adequate roadway clearances for emergency vehicles and evacuation and plan for safe pedestrian evacuation.

Policy HAZ-1.4 Ensure that the City is equipped for disaster, evacuation, and survival thereafter.

Policy HAZ-4.3 Road closures are prohibited unless approved by the City in advance and approved as part of a construction parking and staging plan.

Belvedere Municipal Code

Belvedere Municipal Code sections related to hazards and hazardous materials are as follows:

- Section 16.12.010 adopts the most current California Fire Code, which consists of certain portions of the 2018 edition of the International Fire Code as amended by the California Building Standards Commission.
- Section 16.12.020 indicates that the California Fire Code shall be enforced by the Fire Prevention Bureau of the Tiburon Fire Protection District and shall be operated under the supervision of the Chief of the Tiburon Fire Protection District.
- Sections 16.12.040 through 16.12.100 prohibit the storage of hazardous materials within Belvedere, including Class I, Class II, and Class III liquids in aboveground tanks; tanks of flammable cryogenic fluids; liquefied petroleum gases; explosives and blasting agents; compressed natural gas; and any hazardous materials.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Significance Criteria

Implementation of the project would result in a significant impact related to hazards and hazardous materials if it would:

1. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

2. 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;
3. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
4. 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;
5. 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, result in a safety hazard or excessive noise for people residing or working in the project area;
6. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
7. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

Less-than-Significant Impacts

Routine Transportation, Use, or Disposal of Hazardous Materials

The project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

Operation of the project would not involve the transport, use, or disposal of hazardous materials. During project construction, hazardous materials (e.g., fuel, oils, and compressed gases) would be routinely transported and used at the project site. While Sections 16.12.040 through 16.12.100 of the Belvedere Municipal Code prohibit the storage of hazardous materials within the city, these requirements are applicable to operation of facilities that store significant quantities of hazardous materials and would not apply to the temporary storage of smaller quantities of hazardous materials that are necessary for construction activities. In accordance with Sections 16.12.040 through 16.12.100 of the Belvedere Municipal Code, storage of large quantities of hazardous materials (e.g., fuels, oils, and compressed gases) in aboveground storage tanks would not occur during construction activities. Hazardous materials such as fuels, oils, and compressed gases would be stored in smaller containers such as jugs or buckets of oils, cylinders of compressed gases, and cannisters or truck bed tanks for fuels.

Because the project would result in soil disturbance greater than 1 acre, management of soil and hazardous materials during construction activities would be subject to the requirements of the Stormwater Construction General Permit (described in detail in *Section 4.9, Hydrology and Water Quality* of this EIR), which requires preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes hazardous materials storage requirements. For example, construction site operators must store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed). The management of hazardous materials during construction activities would also be subject to the requirements of Chapter 33 of the California Fire Code, which addresses the safe storage, use, and handling of flammable and combustible liquids and gases.

The routine handling and use of hazardous materials by workers would be performed in accordance with OSHA regulations, which include training requirements for workers and a requirement that hazardous materials are accompanied by manufacturer's Safety Data Sheets. Cal/OSHA regulations include requirements for protective clothing, training, and limits on exposure to hazardous materials. Hazardous materials would be transported by licensed hazardous materials haulers, and hazardous waste would be disposed of at facilities that are permitted to accept such materials as required by DOT, RCRA, and State of California regulations.

Compliance with the existing regulations for hazardous materials discussed above would ensure that project impacts related to the routine transport, use, storage, or disposal of hazardous materials would be less than significant.

Accidental Release of Hazardous Materials

The project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

An accidental release of hazardous materials (e.g., fuels, oils, or compressed gases) during construction could result in exposure of construction workers, the public, and/or the environment to hazardous materials. As discussed above, the project would be subject to the requirements of the Construction General Permit, which requires preparation and implementation of a SWPPP to reduce the risk of spills or leaks from reaching the environment, including procedures to address minor spills of hazardous materials. Measures to control spills, leakage, and dumping must be addressed through structural as well as non-structural best management practices (BMPs). For example, equipment and materials for cleanup of spills must be available on site, and spills and leaks must be cleaned up immediately and disposed of properly. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage. The management of hazardous materials during construction activities would also be subject to the requirements of Chapter 33 of the California Fire Code, which reduce the potential for and risks of hazardous materials releases.

As discussed above, the storage, use, transportation, and disposal of hazardous materials is subject to both federal and state regulations. If a discharge or spill of hazardous materials occurs during transportation, the transporter is required to take appropriate immediate action to protect human health and the environment (e.g., notify local authorities and contain the spill), and is responsible for the discharge cleanup.

Compliance with existing regulations regarding the management, transportation, and disposal of hazardous materials, as discussed under *Regulatory Framework* and *Routine Transportation, Use, or Disposal of Hazardous Materials* above, would ensure that potential impacts related to spills, leaks, or improper disposal of hazardous materials that would be routinely handled during construction would be less than significant.

Hazardous Emissions near Schools

The project would not result in impacts related to emitting hazardous emissions or handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

Reed Elementary School, a public elementary school at 1199 Tiburon Boulevard in Tiburon, is located within one-quarter mile (approximately 800 feet north) of the proposed staging area at the City Corporation Yard. There are no other schools located within one-quarter mile of the project site (California Department of Education, 2022). As described above under *Routine Transportation, Use, or Disposal of Hazardous Materials* and *Accidental Release of Hazardous Materials,* compliance with existing regulations (e.g., OSHA and Cal/OSHA regulations, the California Fire Code, Construction General Permit, and other federal, state, and local regulations) would ensure that hazardous materials transportation, use, and disposal during construction would not result in releases of hazardous materials that could result in significant impacts on human health or the environment, including occupants of nearby schools. Therefore, potential impacts of the project related to hazardous emissions within one-quarter mile of schools would be less than significant.

Hazardous Materials Sites (Government Code Section 65962.5)

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.

The provisions of Government Code Section 65962.5 require DTSC, the State Water Board, the California Department of Health Services, and the California Department of Resources Recycling and Recovery (formerly the California Integrated Waste Management Board) to submit information pertaining to sites associated with solid waste disposal, hazardous waste disposal, LUST sites, and/or hazardous materials releases to the Secretary of Cal/EPA. The project site is not included on any of the lists of hazardous materials release sites compiled in accordance with Government Code Section 65962.5 (Cal/EPA, 2022), and therefore the project would have no associated impact related to significant hazards to the public or the environment.

Aviation Hazards

The project would not be located in the vicinity of a public airport and therefore would not result in airport-related safety hazards or excessive noise for people residing or working in the project area.

The project site is not located within a public airport land use plan area or within 2 miles of a public use airport (Alameda County Community Development Agency, 2010). Therefore, the project would have no impact related to safety hazards to people working or residing in the area due to the proximity of a public airport.

Wildfires

The project would not expose people or structures, either directly or indirectly, to significant risk of loss, injury, or death involving wildland fires.

The project site is not in or near a State Responsibility Area or a Very High Fire Hazard Severity Zone as mapped by CAL FIRE (CAL FIRE, 2008) or a Wildland-Urban Interface area mapped by

the Tiburon Fire Protection District (Tiburon Fire Protection District, 2022). The project site is within a highly urbanized area, and the areas of proposed construction activities that would involve hot work such as torch cutting and welding (the San Rafael Avenue and Beach Road segments of the project site) are not located near areas of dense vegetation that could be susceptible to fires. All construction activities would be performed in accordance with the requirements of the California Fire Code, which would reduce the risk of fires related to construction activities. The proposed construction staging areas along West Shore Road and Belvedere Way are located adjacent to steeply sloped areas with dense vegetation that could be susceptible to vegetation fires; however, there would be no construction activities in these staging areas that could increase the risk of starting fires. Therefore, the project would have a less-than-significant impact related to wildland fire hazards.

Potentially Significant Impacts

Emergency Evacuation and Response

Impact HAZ-1: Use of Belvedere Way for construction staging could physically interfere with the use of Belvedere Way as a pedestrian evacuation route in an emergency. (PS)

The City's General Plan (City of Belvedere, 2010) identifies most of the roadways in the city and many pedestrian lanes in the southern portion of Belvedere Island as evacuation routes, as discussed above under *Environmental Setting*. Two of the most critical emergency evacuation/response routes in the city are San Rafael Avenue and Beach Road. Proposed construction activities along San Rafael Avenue and Beach Road would require closing one lane on these roads, with potential limited periodic closures of both lanes to public traffic. Construction activities requiring lane closures would occur at different times on San Rafael Avenue and Beach Road; therefore, one of these roadways would always remain fully open to public traffic during construction of the project. The portion of roadway closed for construction would be an appropriate distance on either end of the construction work area. While there could be temporary closure of both traffic lanes to normal public traffic on these roads, one lane would always remain available for emergency response and evacuation purposes. Therefore, the project's potential to interfere with the use of San Rafael Avenue and Beach Road as emergency evacuation/response routes would be less than significant.

Belvedere Way is a designated evacuation route that connects from the southern end of West Shore Road to Belvedere Avenue and is the only access point to West Shore Road other than the northern entrance from San Rafael Avenue. The lower segment of Belvedere Way is a pedestrian lane that is not passable by vehicles, and this segment of Belvedere Way is proposed to be used as a construction staging area as shown in Figure 3-9. The lower segment of Belvedere Way is also surrounded by dense vegetation that makes the area susceptible to fire hazards. While no heavy equipment or materials that could potentially increase the risk of fire hazards would be allowed on Belvedere Way (as indicated in Figure 3-9), the proposed use of Belvedere Way for construction staging could physically interfere with the use of this evacuation route that could be critical for safe pedestrian evacuation away from West Shore Road. Implementation of Mitigation Measure HAZ-1 below would ensure that this potential impact would be less than significant.

> *Mitigation Measure HAZ-1: The use of Belvedere Way for construction staging shall not include the storage of combustible or flammable materials on Belvedere Way. The use of*

Belvedere Way for construction staging may include the posting of signs indicating that the area is restricted from public access except for emergency evacuation purposes; however, the use of Belvedere Way for construction staging shall not physically restrict public access to Belvedere Way and shall allow for the safe passage of pedestrians along Belvedere Way at all times. The proposed construction staging uses of Belvedere Way shall be outlined in a Construction Staging Plan to be prepared by the project contractor and submitted to the City of Belvedere and the Tiburon Fire Protection District for review and approval to ensure that construction staging activities would not interfere with the use of Belvedere Way as a pedestrian evacuation route. The *Construction Staging Plan shall designate the materials and equipment that would be stored along Belvedere Way and the areas where they would be stored and shall describe the safety measures (e.g., placement of barricades, cones, and caution tape) to ensure that the storage of materials and equipment would not pose a safety hazard to pedestrians using Belvedere Way. (LTS)*

Cumulative Impacts

This analysis evaluates whether the impacts of the proposed project, together with the impacts of other currently pending or approved projects, would result in a cumulatively significant impact with respect to hazards and hazardous materials. The analysis then considers whether or not the incremental contribution of the impacts associated with the implementation of the proposed project would be significant. Both conditions must apply for a project's cumulative effects to rise to the level of a significant impact. The geographic context for this analysis is the City of Belvedere and nearby areas.

Hazardous Materials

Occurrence of a cumulative effect related to hazardous materials would require that multiple locations release hazardous materials at the same time near each other. Compliance with the existing regulations described under *Regulatory Framework* above would ensure that the project would not result in cumulatively considerable releases of hazardous materials. Therefore, the project would not contribute significantly to cumulative hazardous materials impacts, and the cumulative impact would be less than significant.

Aviation Hazards

Since the project would have no impact related to airport safety, it would not contribute to any cumulative aviation hazards.

Wildfire

Occurrence of a cumulative effect related to wildfire would require multiple projects to contribute to an increased risk of starting wildfires, contribute to the potential spread of wildfire, or contribute to the potential exposure of people and structures to wildfires. As discussed under *Less-than-Significant Impacts* above, the project site is within a highly urbanized area, and the areas of proposed construction activities that would involve hot work such as torching and welding (the San Rafael Avenue and Beach Road segments of the project site) are not located near areas of dense vegetation that could be susceptible to fires. All project construction activities would be performed in accordance with the requirements of the California Fire Code, which would reduce the risk of

fires related to construction activities. The proposed project construction staging areas along West Shore Road and Belvedere Way are located adjacent to steeply sloped areas with dense vegetation that could be susceptible to vegetation fires; however, there would be no construction activities in these staging areas that could increase the risk of starting fires. Therefore, the project would not contribute significantly to cumulative wildfire hazards, and the cumulative impact would be less than significant.

Emergency Response and Evacuation Plans

Occurrence of a cumulative effect related to emergency response and evacuation plans would require that multiple projects interfere with implementation of emergency evacuation/response plans at the same time. As discussed under *Potentially Significant Impacts* above, the project would result in less-than-significant impacts related to interfering with the use of San Rafael Avenue and Beach Road as emergency evacuation/response routes. Implementation of Mitigation Measure HAZ-1 would ensure that the project would result in less-than-significant impacts related to use of the Belvedere Way pedestrian evacuation route as a construction staging area. There are no cumulative projects that would interfere with the use of San Rafael Avenue and Beach Road as emergency evacuation/response routes, or use of Belvedere Way as a pedestrian evacuation route. Therefore, the project would not contribute significantly to cumulative impacts related to adopted emergency response and evacuation plans, and the cumulative impact would be less than significant.

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4.9 HYDROLOGY AND WATER QUALITY

INTRODUCTION

This section of the Draft Environmental Impact Report (EIR) describes the existing hydrological setting of the project site; discusses the federal, state, and local regulations related to water resources that are relevant to the proposed project; assesses potentially significant impacts that could result from the implementation of the project; and provides mitigation measures to reduce the identified impacts to a less-than-significant level, where appropriate. The analysis in this section is based on information obtained from federal, state, and local documents and reports; project planning reports prepared by consultants for the City of Belvedere; information provided as part of applications for environmental regulatory permits; and site reconnaissance inspection of the project site conducted in 2022.

ENVIRONMENTAL SETTING

This section discusses the existing hydrological setting at and near the project site.

Climate

Belvedere has a Mediterranean-type climate that is characterized by warm, dry summers and mild, wet winters. The hottest month is July, with a mean daily maximum temperature of 75 degrees Fahrenheit (°F). The coldest month is January, with a mean daily minimum temperature of 43°F. Snowfall is rare. Normal annual precipitation is about 28 inches. Precipitation is concentrated from October through April when more than 90 percent of the seasonal precipitation normally occurs. On rare occasions during the wet season, as occurred in January 1983, extremely severe storms from the Pacific Ocean can produce surge and wind-generated waves that, coupled with high tides, can overtop the San Rafael Avenue or Beach Road embankment roadways (levees), resulting in coastal flooding.

Runoff and Drainage

The project site encompasses long stretches of the San Rafael Avenue and Beach Road levee roadways where project construction and staging would occur. These areas also contain bayside rock armoring and seawalls, pedestrian walkways and public sitting areas, and narrow bands of land, vegetation, and landscaping on either side of the roadways. The project site also encompasses an approximate 145-foot segment in the Belvedere Lagoon along the interior side of San Rafael Avenue, where the proposed project sheet piling would be constructed above and below the waterline. Additional separate areas outside of San Rafael Avenue and Beach Road are proposed to provide supplemental space for staging.

The existing levees were constructed in the early 1900s as “land bridges” to connect Belvedere Island and the Tiburon Peninsula. In the 1940s and 1950s, the interior area between the levees was dredged to form the 64-acre lagoon and surrounding residential development, which today

consists of about 260 single-family residences. Since that time the levees have been improved to serve multiple functions. The levees function as transportation and utility corridors and as barriers to protect the lagoon and interior residential development from external coastal flooding from the bay while isolating and containing water in the lagoon so it can be operated as an independent water body.

Runoff and Drainage at Belvedere Lagoon

The Belvedere Lagoon receives runoff from several sources, including storm drain discharges composed of runoff generated over the interior residential development, direct rainfall onto the lagoon, and runoff from drainages emanating from the south-facing Tiburon hills and north-facing Belvedere Island. The Reed Diversion and the Tiburon Marsh Diversion are existing pipelines that divert stormwater runoff from the Tiburon hills away from the lagoon for discharge to the bay.

The Belvedere Lagoon Property Owners Association (BLPOA), the homeowners' association composed of the individual owners of properties in the interior residential development, maintains and operates the lagoon. During the summer, BLPOA maintains the lagoon about 1 to 2 feet higher than during the winter. The higher summer level is intended to enhance the recreational enjoyment of the lagoon, and the lower winter level is intended to provide a buffer for flood protection. BLPOA has installed facilities to control the water level in the lagoon. These facilities include four gated, gravity-flow culverts (20″ CMP, 48″ CMP, two 30″ CMPs) crossing beneath the San Rafael Avenue levee to the bay. The culverts also have flap gates on the bay end so that during high tides bay water is prevented from back-flowing into the lagoon. Lagoon water can flow to the bay during low tides and other times when the water level in the lagoon is higher than the bay and the culvert gates are opened. Facilities also include two permanent 10,000-gallon-per-minute pumps that can withdraw water from the lagoon and convey it through a pipe crossing beneath the San Rafael Avenue levee to the bay. This enables BLPOA to draw down the lagoon quickly before or during heavy storms if needed. BLPOA can also install additional temporary pumps if needed to remove additional lagoon water.

Runoff and Drainage at Project Site

The project site contains impervious surfaces on the asphalt levee roadways and concrete sidewalks and gutters, pervious surfaces along the bayside rock-armored slopes, pedestrian walking paths and public sitting areas, and narrow bands of land, vegetation, and landscaping. On the exterior (bayward) side of the levees, stormwater that does not infiltrate into the subsurface of the existing levees runs off directly into the bay. On the interior (lagoonward) side of the existing levees, stormwater that does not infiltrate into the subsurface of the existing levees runs off into adjacent landscaped areas or streets where it drains through the City's storm drain systems into the lagoon. Stormwater that enters the lagoon is eventually discharged to the bay through culverts crossing beneath San Rafael Avenue during BLPOA's water level control operations.

Runoff and Drainage at Other Proposed Construction Staging Areas

Runoff and drainage conditions vary for the separate construction staging areas that are located outside of the San Rafael Avenue and Beach Road embankment roadways (levees). One of these separate staging areas is located in an asphalt-paved parking lot and storage area of the City's corporation yard off Lagoon Road. Runoff from this staging area enters storm drain inlets that drain

into the lagoon. Four separate staging areas are located in turnouts along West Shore Road or Belvedere Way. Runoff from these staging areas enters storm drain inlets that drain to the bay.

Flooding

The project site, local roads, residences, and interior lagoon area are vulnerable to flooding from three primary sources:

- *Coastal flooding during extreme coastal storms that come from the south*: Coastal water can overtop the Beach Road levee and flow overland into the lagoon and also overtop the Tiburon shoreline and flow overland through downtown Tiburon into the lagoon.
- *Coastal flooding during extreme coastal storms that come from the north*: Coastal water can overtop the San Rafael Avenue levee and West Shore Road shoreline and flow overland into the lagoon.
- *Rainfall-runoff flooding during extreme rainfall*: Stormwater runoff draining from surrounding hillsides of Belvedere Island and the Tiburon Peninsula combined with direct rainfall on the lagoon and runoff from the surrounding area can flow into the lagoon through interior storm drains and/or overland flow paths.

Floodwaters entering the lagoon from these sources can flood intervening properties and, upon reaching the lagoon, cause the lagoon water level to rise and flood shoreline residential properties. After the storm that causes the coastal or rainfall-runoff flooding subsides, the floodwaters then drain from the interior residential area through the City's storm drains and the lagoon back to the bay through BLPOA's culverts crossing beneath San Rafael Avenue.

Because coastal storms, which typically come from only one direction, are not necessarily accompanied by extreme rainfall events, and vice versa, flooding from any of these sources and mechanisms would not necessarily be expected to occur at the same time or result from the same storm. Therefore, flooding from these sources and mechanisms is further described separately.

Coastal Flooding

During periods of extreme combinations of tide, storm surge, and/or waves, coastal floodwaters can overtop the more southerly facing shorelines along Beach Road and Tiburon, or the more northerly facing shorelines along San Rafael Avenue and West Shore Road, and flow overland across roads and through properties into the lagoon. The reason for this vulnerability is that the existing levees and shorelines are not high enough to prevent overtopping during severe coastal storms. These levees are as low as 8 feet in elevation relative to the North Atlantic Vertical Datum of 1988 (NAVD88) along certain reaches. Coastal flood levels, including storm surges and waves coupled with high tides, can be higher. Based on Federal Emergency Management Agency (FEMA) analysis (FEMA 2017 effective Flood Insurance Study [FIS]), the probability (or risk) of a coastal tide reaching or exceeding an elevation of 8 feet NAVD88 in any given year is approximately 15 to 20 percent. When considering wave runup, which can significantly raise the height of the coastal water surface and exacerbate overtopping, the risk of coastal flooding is even greater (Stetson Engineers 2022).

In 2012, FEMA completed coastal engineering studies to update its coastal flood maps. FEMA developed a regional-scale hydrodynamic model for San Francisco Bay and transect-based coastal

zone flood models for numerous sites along the Bay shoreline. FEMA used the models to simulate historical water level conditions that account for tide and storm surge, which when combined are known as "stillwater," and also waves. FEMA then performed statistical analyses of the model results to establish base flood elevations and delineate flood zone boundaries throughout the Bay and shoreline. FEMA published these delineations in Flood Insurance Rate Maps (FIRMs). Figure 4.9-1 shows the 2016 FIRM for Belvedere that is currently in effect (FEMA, 2016a).

Most of the project site lies within an area designated by FEMA as "Special Flood Hazard Area Zone AE." Zone AE indicates areas subject to flooding under the FEMA base flood. The FEMA base flood is a flood that has a 1 percent chance of occurring in any given year. On average over the long term, the base flood would be expected to occur about every 100 years. For this reason, it is also known and referred to in this document as the 100-year flood. Relatively smaller areas within the project site are designated as "Other Areas of Flood Hazard, 0.2% Annual Chance Flood Hazard, Areas of 1 percent annual chance flood with average depth less than one foot." This designation indicates areas subject to flooding under the 500-year flood and potentially subject to flooding under the 100-year flood due to coastal wave overtopping with depth less than 1 foot.

The interior lagoon area is vulnerable to both coastal flooding from overtopping of the levees and rainfall-runoff entering the lagoon from the surrounding drainages and direct rainfall. However, coastal flooding is the dominant threat and, as such, is the basis for FEMA's flood hazard designation. The 2016 FIRM designates the interior lagoon area as "Special Flood Hazard Area Zone AE" with a base flood elevation (BFE) of 10 feet.[1] This BFE comes from the 100-year stillwater level derived from FEMA's analysis, elevation of 9.7 feet rounded to 10 feet. The 2016 FIRM designates the area bayward of Beach Road as "Special Flood Hazard Area Zone VE" with a BFE of 11 feet. Zone VE identifies areas subject to flooding under the FEMA base flood elevation that have additional hazards associated with storm waves. The area bayward of San Rafael Avenue is designated "Special Flood Hazard Area Zone AE" with a BFE of 10 feet opposite San Rafael Avenue's south end and a BFE of 11 feet opposite its north end due to storm waves.

Rainfall-Runoff Flooding

During extreme rainfall events, stormwater runoff draining from surrounding hillsides of Belvedere Island and the Tiburon Peninsula that are not diverted in storm pipelines directly to the bay can flow into the lagoon through interior storm drains and/or overland flow paths. These floodwaters entering the lagoon combined with direct rainfall on the lagoon can cause the lagoon water level to rise and flood shoreline residential properties. BLPOA's water control facilities and seasonal water level operations provide sufficient capacity to prevent flooding of shoreline properties caused by runoff and direct precipitation into the lagoon for rainfall-runoff floods[2] up to the 100-year flood.

[1] BFE is the elevation of surface water resulting from the 100-year flood.

[2] Assumes only rainfall-runoff floodwater enters the lagoon, and coastal floodwaters do not overtop the levees.

LEGEND

Project site

SOURCE: Federal Emergency Management Agency (FEMA), 2016. Flood Insurance Rate Map (FIRM), Marin County, California, Map Number 06041C0488E, 06041C0489E, 06041C0526E, 06041C0527E, revised March 16, 2016

Figure 4.9-1

FLOOD ZONES IN BELVEDERE

Coastal Hazards

The proximity of the project site to San Francisco Bay and the elevation of the levees (8 to 11 feet NAVD88) could expose the project site to coastal hazards such as sea level rise, seiche, tsunami, or extreme high tides, as further described below.

Sea Level Rise

According to the San Francisco Bay Conservation and Development Commission (BCDC), sea level (including that in San Francisco Bay) is rising and is expected to continue rising even with existing efforts to mitigate global warming through the reduction of greenhouse gas emissions (BCDC, 2011). Rates of sea level rise vary at specific locations, as local subsidence or uplift affects the relative change in sea level between land masses and the ocean. To help cities, counties, and the state prepare for and adapt to sea level rise, the State of California Ocean Protection Council (OPC), in coordination with other state agencies, prepared the "State of California Sea-Level Rise Guidance: 2018 Update" (Guidance). According to the Guidance, likely sea level rise in the San Francisco Bay Area is projected as follows (OPC, 2018):

- 2000–2050: "Likely" 0.6 – 1.1 feet; "1-in-20 Chance" 1.4 feet; with an unlikely but possible rise of up to 2.7 feet
- 2000–2100: "Likely" 1.6 – 3.4 feet; "1-in-20 Chance" 4.4 feet; with an unlikely but possible rise of up to 10.2 feet

Seiche

A seiche is the oscillation of a body of water. Seiches occur most frequently in enclosed or semi-enclosed basins such as lakes, bays, or harbors. A seiche can be triggered in an otherwise still body of water by strong winds, changes in atmospheric pressure, earthquakes, tsunami, or tides. Triggering forces that set off a seiche are most effective if they operate at specific frequencies relative to the size of an enclosed basin. Coastal measurements of sea level often show seiches with amplitudes of a few centimeters and periods of a few minutes due to oscillations of the local harbor, estuary, or bay, superimposed on the normal tidal changes. Seiches are not considered a hazard in San Francisco Bay based on the Bay's natural oscillations (Borrero et al., 2006).

Tsunami

Tsunamis are long-period water waves caused by underwater seismic events, volcanic eruptions, or undersea landslides. Tsunamis affecting the San Francisco Bay Area would originate west of the Bay in the Pacific Ocean. Areas that are highly susceptible to tsunami inundation tend to be low-lying coastal areas, such as tidal flats, marshlands, and former Bay margins that have been artificially filled. Inundation or damage caused by a tsunami could disrupt traffic in those low-lying areas. A tsunami entering San Francisco Bay through the relatively narrow Golden Gate would tend to dissipate because the energy of the wave spreads out as the Bay becomes wider and shallower (Borrero et al., 2006). The California Tsunami Hazard Area Map for the San Francisco Bay represents the maximum considered tsunami runup from several extreme, infrequent, and realistic tsunami sources. These data are intended for local jurisdictional, coastal emergency planning uses only. The Tsunami Hazard Area Map is primarily based on inundation limits corresponding to a 975-year average return period tsunami event model. The Tsunami Hazard

Area Map for the San Francisco Bay shows that the San Rafael Avenue and Beach Road levees would not withstand the maximum considered tsunami and the Belvedere Lagoon and shoreline properties would be inundated.

Extreme High Tides

Extreme high tides in San Francisco Bay result from the combined effects of astronomical high tides (related to the lunar cycle) and other factors such as winds, barometric pressure, ocean temperatures, and freshwater runoff. In California, the highest astronomical tides occur in the summer and winter; therefore, extreme high tides are most likely to occur during these seasons. According to FEMA's 2012 coastal engineering studies, the 100-year stillwater high tide elevation (i.e., the elevation of an extremely high tide with a 1 percent chance of occurring in any given year) is approximately 9.7 feet NAVD88 bayward of San Rafael Avenue and Beach Road levees and West Shore Road. For comparison, the San Rafael Avenue and Beach Road levees in some places are as low as 8 feet NAVD88.

Surface Water and Groundwater Quality and Beneficial Uses

The quality of surface water and groundwater in the vicinity of the project site is affected by past and current land uses at the site and surrounding area and the composition of geologic materials in the vicinity. The State Water Resources Control Board (State Water Board), through its nine Regional Water Quality Control Boards (RWQCBs), regulates the water quality of surface water and groundwater bodies throughout California. In the Bay Area, the San Francisco Bay RWQCB is responsible for implementing the Water Quality Control Plan (Basin Plan) (San Francisco Bay RWQCB, 2017). The Basin Plan establishes beneficial water uses for waterways and water bodies within the region and is a master policy document for managing water quality in the region.

Coastal water bayward of Beach Road lies within Central San Francisco Bay, which is listed in the Basin Plan as providing the beneficial uses of industrial service supply, industrial process supply, commercial and sport fishing, shellfish harvesting, estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact and noncontact recreation, and navigation. Coastal water bayward of San Rafael Avenue levee lies within Richardson Bay, which is listed in the Basin Plan as providing the beneficial uses of industrial service supply, commercial and sport fishing, shellfish harvesting, estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact and noncontact recreation, and navigation. Beneficial uses for the Belvedere Lagoon, which are not separately listed in the Basin Plan, are included in the beneficial uses for Richardson Bay (San Francisco Bay RWQCB, 2017).

As described under *Regulatory Framework* below, under Section 303(d) of the Clean Water Act (CWA), the states must present the United States Environmental Protection Agency (EPA) with a list of "impaired water bodies,"[3] which in some cases results in the development of a total maximum daily load (TMDL). On a broad level, the TMDL process leads to a "pollution budget" designed to restore the health of a polluted body of water. The TMDL process provides a quantitative assessment of water quality problems, contributing sources of pollution, and the

[3] "Impaired water bodies" are defined as water bodies that do not meet water quality standards.

pollutant load reductions or control actions needed to restore and protect the beneficial uses of an individual water body impaired from loading of a particular pollutant.

The State Water Board has listed Central San Francisco Bay as an impaired water body due to impacts from pollutants that include toxic organics (furan compounds, polychlorinated biphenyls [PCBs], dioxin compounds), pesticides (dieldrin, dichlorodiphenyltrichloroethane [DDT], chlordane), pathogens, metals (mercury, selenium), invasive species, and trash. The State Water Board has listed Richardson Bay as an impaired water body due to impacts from pollutants that include toxic organics (furan compounds, PCBs, dioxin compounds), pesticides (dieldrin, DDT, chlordane), pathogens, metals (mercury), and invasive species (State Water Board, 2018). TMDLs have been approved by the EPA and officially incorporated into the Basin Plan for PCBs, mercury, and pathogens in Central San Francisco Bay and Richardson Bay and also for selenium in Central San Francisco Bay (San Francisco Bay RWQCB, 2016).

The project site is not located in a defined and identified groundwater basin in *California's Groundwater* (Bulletin 118), the State of California's official publication on the occurrence and nature of groundwater in California. The known closest groundwater well to the project site is owned by the City and is located in Belvedere Park adjacent to City Hall at 450 San Rafael Avenue, which is about 1,200 feet from the project site along the Beach Road levee. The City uses the groundwater pumped from the well to irrigate the park. Geotechnical investigations in the vicinity of San Rafael Avenue and Beach Road found that groundwater at the project site can be encountered at depths of 3 to 8 feet below the ground surface (Miller Pacific Engineering Group, 2022). Due to proximity to the bay, groundwater quality in the project area along the San Rafael Road and Beach Road levees would be expected to be impaired due to high salinity as a result of tidal influence.

REGULATORY FRAMEWORK

Federal, state, and local regulations and plans relevant to hydrology and water quality for the area of the project site are described below.

Federal Regulations

The federal CWA of 1972 and subsequent amendments, under the enforcement authority of the EPA, were enacted "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The CWA gave the EPA the authority to implement pollution control programs, such as setting wastewater standards for industry. It also set water quality standards for surface waters and established the National Pollutant Discharge Elimination System (NPDES) program to protect water quality.

CWA Section 303(d) List of Impaired Water Bodies and TMDLs

In accordance with Section 303(d) of the CWA, the states must present the EPA with a list of "impaired water bodies," defined as those water bodies that do not meet water quality standards. The CWA requires the development of TMDLs or other actions to improve the water quality of impaired water bodies. Implementation of this program in the project area is conducted by the San Francisco Bay RWQCB as discussed under *State Regulations* below.

CWA Section 402

Under Section 402 of the CWA, discharge of pollutants to navigable waters is prohibited unless the discharge complies with an NPDES permit. Implementation and enforcement of the NPDES program is conducted through the State Water Board and the nine RWQCBs. Each RWQCB sets standard conditions for the permittees in its region, which include effluent limitations and monitoring programs. The proposed project would be subject to NPDES permits as described under *State Regulations* below.

CWA Section 404

Under Section 404 of the CWA, a permit must be obtained from the United States Army Corps of Engineers (Corps) for work within waters of the United States, including wetlands. The Corps reviews applications for permits in accordance with Section 404 guidelines, which have been established by the Corps and the EPA, and typically limits and requires mitigation for impacts on waters of the United States before issuing a permit. The proposed project would require a Section 404 permit based on the proposed construction activities within waters of the United States.

CWA Section 401

Section 401 of the CWA requires compliance with state water quality standards for actions within state waters. Compliance with the water quality standards required under Section 401 is a condition for issuance of a Section 404 permit. Under Section 401 of the CWA, every applicant for a federal permit or license for any activity that may result in a discharge to a water body must obtain a State Water Quality Certification that the proposed activity would comply with state water quality standards. A State Water Quality Certification would be required for the proposed project because a Section 404 permit would be required, as discussed above. The RWQCBs issue 401 Water Quality Certifications for projects that would take place within their jurisdictions.

State Regulations

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides for the protection of the quality of all waters of the State of California for use and enjoyment by the people of California. The act also establishes provisions for a statewide program for the control of water quality, recognizing that waters of the state are increasingly influenced by inter-basin water development projects and other statewide considerations and factors such as precipitation, topography, population, recreation, agriculture, industry, and economic development vary regionally within California. The statewide program for water quality control is therefore administered on a local level with statewide oversight. Within this framework, the act authorizes the State Water Board, through the RWQCBs, to oversee the coordination and control of water quality within California.

Stormwater Programs

Stormwater quality is regulated by the NPDES program, established through the federal CWA. The NPDES program objective is to control and reduce pollutant discharges to surface water bodies. Compliance with NPDES permits is mandated by state and federal statutes and regulations. The RWQCBs administer a number of stormwater programs to regulate the discharge of pollutants to

surface waters from various sources, including construction site stormwater discharges and municipal stormwater discharges.

Municipal Permit

Pursuant to Section 402 of the CWA and the Porter-Cologne Water Quality Control Act, municipal stormwater discharges within Belvedere are regulated under Phase II Small Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit, Water Quality Order No. 2013-0001-DWQ, General Permit No. CAS000004 (Phase II Stormwater Permit) (San Francisco Bay RWQCB, 2015). The MS4 permit is overseen by the RWQCB. The City participates in the Marin Countywide Stormwater Pollution Prevention Program, which provides guidance and assistance to municipalities in Marin County, helping them to comply with the requirements of the MS4 Permit.

MS4 Permit provision E.12.c.ii.4.c addresses post-construction stormwater management requirements for development projects. This provision provides an exclusion for impervious trails built to direct stormwater runoff to adjacent vegetated areas, or other non-erodible permeable areas, preferably away from creeks or toward the outboard side of levees (San Francisco Bay RWQCB, 2015).

Construction General Permit

Projects disturbing more than 1 acre of land during construction are required to comply with the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ, NPDES No. CAS000002 (Construction General Permit) (State Water Board Division of Water Quality, 2009).

To obtain coverage under the Construction General Permit, a project applicant must provide, via electronic submittal, a Notice of Intent (NOI), a Stormwater Pollution Prevention Plan (SWPPP), and other documents required by Attachment B of the Construction General Permit. Activities subject to the Construction General Permit include clearing, grading, and disturbances to the ground, such as grubbing or excavation. The permit also covers linear underground and overhead projects such as sheet piling installations. Construction General Permit activities are enforced at a local level by the San Francisco Bay RWQCB.

The Construction General Permit uses a risk-based permitting approach and mandates certain requirements based on the project risk level (i.e., Level 1, Level 2, or Level 3). The project risk level is based on the risk of sediment discharge and the receiving water risk. The sediment discharge risk depends on the project location and timing (i.e., wet season versus dry season activities). The receiving water risk depends on whether the project would discharge to a sediment-sensitive receiving water. The determination of the project risk level would be made by the project applicant when the NOI is filed (and more details of the timing of the construction activity are known).

The performance standard in the Construction General Permit is that dischargers shall minimize or prevent pollutants in stormwater discharges and authorized non-stormwater discharges through the use of controls, structures, and best management practices (BMPs) that achieve best available technology (BAT) for treatment of toxic and nonconventional pollutants and best conventional technology (BCT) for treatment of conventional pollutants. A SWPPP must be prepared by a

Qualified SWPPP Developer (QSD) that meets the certification requirements in the Construction General Permit (including required professional credentials and/or passage of training courses). The purpose of the SWPPP is to (1) help identify the sources of sediment and other pollutants that could affect the quality of stormwater discharges, and (2) describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater as well as non-stormwater discharges resulting from construction activity. Operation of BMPs must be overseen by a Qualified SWPPP Practitioner that meets the requirements outlined in the permit.

The SWPPP must also include a construction site monitoring program. Depending on the project risk level, the monitoring program may include visual observations of site discharges, water quality monitoring of site discharges (pH, turbidity, and nonvisible pollutants, if applicable), and receiving water monitoring (pH, turbidity, suspended sediment concentration, and bioassessment).

Local Regulations

Applicable local regulations related to hydrology and water quality are described below.

City of Belvedere General Plan

The following goals, policies, and programs from the City's General Plan Safety Element related to hydrology and water quality pertain to the proposed project (City of Belvedere, 2010):

Goal HAZ-2	Ensure protection of life, natural environment, and property from natural and manmade hazards due to flood damage.
Policy HAZ-2.1	Limit new construction in floodplains unless mitigation measures are incorporated.
Action HAZ 2.1.1	Discourage new critical facilities from being located in floodplains.
Policy HAZ-2.2	Any proposed new development along the shoreline and in the Belvedere Lagoon area should be evaluated for its potential for adverse impacts from tsunamis and sea level rise.
Actions HAZ-2.2.1	For areas identified as potential locations for adverse impacts from tsunamis, mitigation measures should be identified such as the utilization of early warning systems, as well as specific project design options.
Policy HAZ-2.3	Maintain a Local Hazard Mitigation Plan (LHMP).
Action HAZ-2.3.1	Update the LHMP every five years; the last was adopted in 2005.
Action HAZ-2.3.2	Coordinate with other cities in the document update through ABAG.
Policy HAZ-2.4	Incorporate FEMA guidelines and suggested activities into local government plans and procedures for managing flood hazards.
Action HAZ-2.4.1	Ensure regular update of FEMA regulations.

Policy HAZ-2.5 Participate in creating an improved hazard mitigation plan for the Bay Area region.

Action HAZ-2.5.1 Provide ABAG geographically defined repetitive flooding loss data as part of the City Manager's request for support.

Policy HAZ-2.6 Continue to evaluate the feasibility and implementation of new seawall construction.

Action HAZ-2.6.1 Establish a citizens' committee comprised of Lagoon-area residents and the BLPOA, among others, to evaluate the feasibility and implementation issues associated with new seawall design and construction. The committee shall evaluate seawalls both along San Rafael Avenue and Beach Road.

Belvedere Municipal Code

The following provisions of the Belvedere Municipal Code related to hydrology and water quality pertain to the proposed project:

Chapter 8.36: Urban Runoff Pollution Prevention

8.36.010 Title.

This Chapter shall be known as the "City of Belvedere urban runoff pollution prevention ordinance" and may be so cited. (Ord. 2015-2 § 2, 2015.)

8.36.020 Purpose and intent.

The purpose of this Chapter is to ensure the future health, safety, and general welfare of City citizens and to protect and enhance watercourses, fish, and wildlife habitats by:

A. Minimizing discharges other than storm runoff to storm drains or watercourses.

B. Responding to the discharge of spills, preventing, and controlling the discharge of spills to storm drains or watercourses, and prohibiting dumping or disposal of materials other than stormwater.

C. Reducing pollutants in stormwater discharges to the maximum extent practicable.

D. Requiring operators of construction sites, new or redeveloped land, and industrial and commercial facilities to install, implement, or maintain appropriate best management practices (BMPs); and

E. Maintaining pre-development stormwater runoff rates and preventing nonpoint source pollution whenever possible, through stormwater management controls and ensuring that these management controls are properly maintained.

The intent of this Chapter is to protect and enhance the water quality of the State's, and the nation'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) National Pollutant Discharge Elimination System (NPDES) Permit, Water Quality Order No. 2013-0001-DWQ, General Permit No. CAS000004 (Phase II Stormwater Permit) and subsequent revisions and amendments thereto. (Ord. 2015-2 § 2, 2015.)

8.36.050 Construction and application.

This Chapter shall be construed to assure consistency with the requirements of the federal Clean Water Act (33 U.S.C. § 1251 et seq.) and acts amendatory thereof or supplementary thereto, and applicable implementing regulations, including the current and future versions of the water quality control plan for the San Francisco Bay basin and the Phase II Stormwater Permit. (Ord. 2015-2 § 2, 2015.)

8.36.060 Discharge of pollutants.

A. The discharge of non-stormwater discharges to the City storm drain system is prohibited. All discharges of material other than stormwater must be in compliance with an NPDES permit issued for the discharge.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This section discusses the potential impacts related to hydrology and water quality that could result from the implementation of the project. Included are (1) the criteria of significance (consistent with Appendix G of the California Environmental Quality Act [CEQA] Guidelines), which establish the thresholds for determining whether an impact is significant; (2) the hydrology and water quality impacts that could result from construction and/or operation of the project and any necessary mitigation measures to reduce significant impacts; and (3) cumulative hydrology and water quality impacts.

Significance Criteria

The project would have a significant effect on hydrology or water quality if it would:

1. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;
2. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;
3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
    i. result in substantial erosion or siltation on- or off-site;
    ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;

iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

iv. impede or redirect flood flows;

4. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation; or

5. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Less-Than-Significant Impacts

Impact on Groundwater Supplies

The project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

Dewatering of groundwater is not planned during project construction activities; however, in the event that dewatering becomes necessary, mitigation would be implemented. Mitigation for potential dewatering activities is described in *Section 4.3, Biological Resources*, of this EIR (see Mitigation Measure BIO-1a).

No local groundwater supplies would be used during the construction or post-construction phases. The project would not interfere with groundwater recharge because the project would not have a substantial effect on the infiltration of stormwater. The impact would be less than significant.

Alteration of Drainage Patterns Resulting in Erosion or Siltation

The project would not substantially alter the existing drainage pattern in a manner that would result in substantial erosion or siltation on- or off-site.

The project site is not located near a natural watercourse such as a stream or river. The proposed project would include installation of sheet piling that would be finished at or below the existing grade. Features that would be disturbed by sheet pile installation, such as sidewalks and walking paths, streets, gutters, and landscaping, would be restored in-kind and at existing grade. Therefore, the proposed project would not modify streams or rivers nor substantially alter the existing drainage patterns of the project site. The project would therefore have a less-than-significant impact on erosion or siltation associated with changing drainage patterns.

Alteration of Drainage Patterns Resulting in Flooding

The project would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.

As discussed above, the project site is not located near a natural watercourse such as a stream or river. The proposed project would include installation of sheet piling that would be finished at or below the existing grade. Features that are disturbed by sheet pile installation, such as sidewalks and walking paths, streets, gutters, and landscaping, would be restored in-kind and existing grade.

Therefore, the proposed project would not affect surface runoff. The project would therefore have a less-than-significant impact on flooding associated with changing drainage patterns.

Contribution of Polluted Runoff or Exceedance of Storm Drain System Capacity

The project would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

The proposed project would include installation of sheet piling that would be finished at or below existing grade. Features that are disturbed by sheet pile installation, such as sidewalks and walking paths, streets, gutters, and landscaping, would be restored at the existing grade. Therefore, the proposed project would not substantially increase sources of polluted runoff and would not affect surface runoff nor increase stormwater discharges.

During construction, sheet pile installation would disturb existing features such as sidewalks and walking paths, streets, gutters, and landscaping, which would expose soils and make them vulnerable to erosion in the rare event of severe coastal flooding. During project construction, the contractor would be required by the construction contract to track storm forecasts and limit the extent of exposed soils to areas that could be readily protected from erosion at any given time. With storm forecasting and by limiting exposed soils areas through the use of BMPs, such as applying covers, there would be sufficient time for the contractor to implement erosion protection measures prior to arrival of the forecasted storm. These preventative actions would minimize the erosion potential, and the impact would be less than significant.

Due to erosion protection measures that would be required during construction, the proposed project would have a less-than-significant impact on the conveyance capacity of the City's storm drain system and contribution to additional sources of polluted runoff.

Impact on Flood Flows (Dam and Levee Failure)

The project would not impede or redirect flood flows.

The San Rafael Avenue and Beach Road levees are not currently certified by FEMA as levees that provide protection from coastal flooding. Regardless, the finished project would not raise the height of the levees and, therefore, would have no effect on the water holding capacity of the lagoon nor on the current flood protection function provided by the levees, either positively or negatively. The project would not subject the levees to higher lagoon water levels nor any increased risk of failure; rather, it would accomplish the opposite, which would be to strengthen the levees and protect them from damage during strong seismic shaking.

During construction, construction areas and storage areas could become more vulnerable to failure due to excavation activities and removal of rip-rap to accommodate sheet piling installation. During project construction, the contractor would be required to track storm forecasts and to limit the extent of segments of the San Rafael levee to be modified at any given time, so that there is sufficient time to restore modified levee segments before a storm. With storm forecasting and by limiting the extent of levee modifications at any given time, there should be sufficient time for the contractor to restore the modified levee segments prior to the arrival of the forecasted storm. These

preventative actions would minimize the potential for levee failure and redirection of flood flows, and the impact would be less than significant.

The project would not risk release of pollutants due to project inundation from seiches, tsunamis, or flooding.

As discussed above, seiches are not considered a hazard in San Francisco Bay based on the Bay's natural oscillations (Borrero et al., 2006).

As discussed above, the existing San Rafael Avenue and Beach Road levees would not withstand the coastal flood levels during extreme flood events caused by rare, extreme coastal storms and tsunamis. The San Rafael Avenue and Beach Road levees, Belvedere Lagoon and shoreline properties would be inundated. The project would not result in a change to levee height.

During project construction, the contractor would be required to track coastal flood forecasts and tsunamis. Temporary flooding of the construction site and risk of release of pollutants is considered a less-than-significant impact because coastal floods and tsunamis are low-probability events and construction crews would be able to anticipate the flooding and move equipment and supplies to high ground before the flooding occurred.

Interference with Water Quality Control Plans or Sustainable Groundwater Management Plans

The project would not involve activities or actions that would conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

The project would include construction activities and storm water pollution prevention actions associated with the installation of sheet piling that would be finished at or below existing grade. Features that are disturbed by sheet pile installation, such as sidewalks and walking paths, streets, gutters, and landscaping, would be restored at the existing grade. Groundwater dewatering is not planned. Therefore, these activities and actions would not obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Potentially Significant Impacts

Impact HYDRO-1: During construction, the proposed project could result in degradation of water quality in the Belvedere Lagoon and San Francisco Bay. (PS)

Construction activities on the project site would involve the installation of sheet piling near or below the waterline at two locations: (1) in the lagoon along an approximately 145-foot-long segment on the interior side of the San Rafael Avenue levee, and (2) in the Bay along an approximately 400-foot-long segment on the exterior side of the Beach Road levee. The action of the sheet piling installation could produce a limited amount of incidental soil side cast and could cause ground shaking and vibrations. These actions could result in the disturbance or removal of soils and the release of sediment into the water column. The release of sediment into the water column could cause increased sedimentation and turbidity in the lagoon, resulting in the degradation of water quality.

Sheet piling installation equipment and materials would also have the potential for chemical releases. Once released, substances such as fuels, oils, lubricants, and solvents could be transported to the lagoon or directly into the Bay, resulting in degradation of water quality.

Since the lagoon is hydraulically connected to the Bay by way of BLPOA's culverts and other water control facilities along San Rafael Avenue, substances released to the lagoon could potentially be transported to Richardson Bay and San Francisco Bay.

Construction activities on the project site would involve disturbance and exposure of soils through the removal of existing pavement and vegetative cover, excavation for construction of sheet piling, and placement and grading of fill, pavement, and landscaping materials to restore areas disturbed by construction to their pre-project conditions and grade. These activities would result in the exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. If not managed properly, the runoff could cause increased sedimentation and turbidity in surface waters within and outside of the project site, resulting in the degradation of water quality.

The potential for chemical releases is present at most construction sites and staging areas. Once released, substances such as fuels, oils, paints, and solvents could be transported to nearby surface waterways in stormwater runoff, wash water, and dust control water, potentially reducing the quality of the receiving waters.

Not only could construction activities result in releases of contaminants (e.g., fuels and lubricants used for construction equipment) to the ground surface of the work areas along the levee and at the staging areas (which could be transported to receiving waters in stormwater runoff), but the project could release contaminants directly into San Francisco Bay due to the proximity of the Bay to some of the work areas. Construction activities adjacent to the Bay would also cause disturbance of soil or sediments along the banks of the Bay that could result in increased turbidity in surface waters. This is a potentially significant impact.

After construction is completed, the project improvements and restored areas would be subject to the same stormwater and other water conditions that currently exist. The sheet piling would be finished at or below the existing grade. At- or above-ground features that are disturbed by sheet pile installation, such as sidewalks and walking paths, streets, gutters, and landscaping, would be restored in kind and at existing grade. Therefore, post-construction, the project would not degrade water quality.

> *Mitigation Measure HYDRO-1a: The following measures shall be implemented to reduce the risk of disturbed soils and spills/releases from affecting water quality in nearby surface waters during construction activities near or below the waterline of San Francisco Bay and the Belvedere Lagoon:*
>
> - *The contractor(s) shall avoid sheet piling installation in the Bay along the exterior side of the Beach Road levee during tidal periods when the tidal water level is at 2.5 feet mean lower low water (MLLW) or higher.*
> - *The contractor(s) shall install a turbidity curtain in the Bay to hydraulically isolate the narrow, approximately 400-foot-long strip of the bay where sheet pile installation occurs from the rest of the Bay. The turbidity curtain shall remain in place for the duration of*

installation activities and thereafter until such time that any increased turbidity has settled out and concrete has fully cured.

- *The contractor(s) shall install a turbidity curtain in the lagoon to hydraulically isolate the portion of the lagoon where sheet pile installation occurs from the rest of the lagoon. The turbidity curtain shall remain in place for the duration of installation activities and thereafter until such time that any increased turbidity has settled out.*
- *The contractor(s) shall coordinate with the City of Belvedere Public Works Department and the Belvedere Lagoon Property Owners Association (BLPOA) to ensure that the lagoon is drawn down to the winter operating level prior to and for the duration of sheet pile installation activities in the lagoon and BLPOA's culverts and other water control facilities along San Rafael Avenue are shut off from the Bay for the duration of sheet piling installation and thereafter while the turbidity curtain remains installed.*

Mitigation Measure HYDRO-1b: The following measures shall be implemented to reduce the risk of spills, releases, and disturbed soils affecting water quality in nearby surface waters during construction activities:

- *The contractor(s) shall designate storage areas suitable for material delivery, storage, and waste collection for disposal. Waste shall be disposed of off-site in a manner that complies with applicable regulations for waste disposal. These locations shall be as far away from catch basins, gutters, drainage courses, and water bodies as possible. All hazardous materials and wastes used or generated during project site development activities shall be labeled and stored in accordance with applicable local, state, and federal regulations. In addition, an accurate up-to-date inventory, including Material Safety Data Sheets (MSDSs), shall be maintained on-site to assist emergency response personnel in the event of a hazardous materials incident.*
- *All maintenance and fueling of construction vehicles and equipment shall be performed in a designated bermed area, or over a drip pan that would not allow runoff of spills. Vehicles and equipment shall be regularly checked and have leaks repaired promptly at an off-site location. Secondary containment shall be used to catch leaks or spills any time vehicle or equipment fluids are dispensed, changed, or poured.*
- *The contractor shall implement a Storm Water Pollution Prevention Plan (SWPPP) prepared by a Qualified SWPPP Developer (QSD) and designed to reduce potential adverse impacts on surface water quality during the construction period. The SWPPP shall include the minimum BMPs required for the identified risk level. BMP implementation shall be consistent with the BMP requirements in the most recent version of the California Stormwater Quality Association Stormwater Best Management Handbook-Construction. The SWPPP shall be designed to address the following objectives:*
    1) *All pollutants and their sources, including sources of sediment associated with construction activity, are controlled.*
    2) *Where not otherwise required under a Regional Water Quality Control Board (RWQCB) permit, all non-stormwater discharges are identified and either eliminated, controlled, or treated.*

3) *Site BMPs are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from construction activity.*

4) *Stabilization BMPs installed to reduce or eliminate pollutants and erosion of exposed soil after construction are completed. Stabilization BMPs may include but would not be limited to hydroseeding, planting of vegetation, installation of jute/burlap netting, and installation of swales in graded areas.*

5) *BMPs shall be designed to mitigate construction-related pollutants and at a minimum, include the following:*

   a. *Practices to minimize the contact of construction materials, equipment, and maintenance supplies (e.g., fuels, lubricants, paints, solvents, and adhesives) with stormwater shall be included. The SWPPP shall specify properly designed centralized storage areas that keep these materials out of the rain.*

   b. *Practices to reduce erosion of exposed soil, which may include but arenot limited to soil stabilization controls, watering for dust control, perimeter silt fences, placement of hay bales, and sediment basins, shall be included.*

   c. *If grading or other ground-disturbing activities must be conducted during the rainy season, the primary BMPs selected shall focus on erosion control (i.e., keeping sediment on the site). End-of-pipe sediment control measures (e.g., basins and traps) shall be used only as secondary measures. Ingress and egress from the construction site shall be carefully controlled to minimize off-site tracking of sediment. Vehicle and equipment wash-down facilities shall be designed to be accessible and functional during both dry and wet conditions.*

6) *The SWPPP shall specify a monitoring program to be implemented by the construction site supervisor and shall include both dry and wet weather inspections. Monitoring shall be required during the construction period for pollutants that may be present in the runoff that are "not visually detectable in the runoff."*

- *Site supervisors shall conduct regular tailgate meetings to discuss pollution prevention. The frequency of the meetings and required personnel attendancelist shall be specified in the SWPPP.*
- *A Qualified SWPPP Practitioner (QSP), hired by the contractor, shall be responsible for overseeing implementation of BMPs at the site. The QSP shall be a qualified professional that has the required professional credentials and has passed specific training courses in accordance with the Construction General Permit. The QSP shall also be responsible for performing all required monitoring, and BMP inspection, maintenance, and repair activities. The QSP shall retain an independent monitor to conduct weekly inspections and provide written weekly reports to the City of Belvedere Public Works Department and/or the project team to ensure compliance with the SWPPP.*

Mitigation Measure HYDRO-1c: Contractor(s) shall obtain applicable resource agency permits and approvals and comply with permit requirements to prevent impacts on water quality and demonstrate that water quality standards and/or waste discharge requirements are not violated. Permit requirements and avoidance measures that may be required by the

U.S. Army Corps of Engineers and/or the San Francisco Bay Regional Water Quality Control Board (RWQCB) may include but not be limited to the following:

- *Installation of physical barriers (e.g., silt curtains, turbidity curtains) to prevent potential localized impacts on water quality (e.g., increase in turbidity) from spreading to surrounding surface waters;*
- *Installation of physical barriers or use of tanks to contain wastewater generated during construction and prevent potential localized impacts to water quality of surrounding surface waters; and*
- *Performance of water quality monitoring, including sampling and analysis for turbidity and total suspended solids.*

At the direction of the applicable resource agency, the results of the water quality monitoring shall be compared to established performance standards. If water quality monitoring indicates that performance standards are not being achieved, additional avoidance measures (e.g., installation of additional silt curtains) shall be implemented until water quality monitoring indicates that performance standards are being achieved, which would mitigate the potential impacts on water quality to a less-than-significant level.

Compliance with the Construction General Permit and implementation of Mitigation Measures HYDRO-1a, HYDRO-1b, and HYDRO-1c would ensure that potential impacts on waterquality would be less than significant. (LTS)

Cumulative Impacts

The geographic area of concern for cumulative hydrology and water quality impacts is Belvedere and the surrounding water bodies, primarily the Belvedere Lagoon, Richardson Bay, and San Francisco Bay. Even though the State Water Board has not listed the lagoon, Richardson Bay, or Central San Francisco Bay (the receiving water adjacent to the project site) as impaired for sediment, it is recognized that erosion and sediment discharge can have adverse effects on water quality. Nevertheless, the project's contribution to sedimentation in the lagoon or Bay would not be cumulatively considerable due to the implementation of Mitigation Measures HYDRO-1a, HYDRO-1b, and HYDRO-1c.

Stormwater discharges are affected by urban pollutants that contribute to the degradation of water quality in surface waters near the project site, including the Belvedere Lagoon and San Francisco Bay. Urban pollutants in stormwater include petroleum hydrocarbons, sediments, metals, pesticides, and trash. Past, current, and reasonably foreseeable projects in the vicinity of the project site could result in cumulative impacts associated with stormwater discharges, similar to the potential impacts from the construction of the project. To adequately address cumulative water quality impacts, stormwater regulations have become progressively more stringent since the passage of the federal CWA, and NPDES permits now require new development and redevelopment projects to manage and treat all significant sources of stormwater pollutants and reduce runoff. NPDES permit requirements apply to the cumulative projects as well as this project. As such, a reduction in overall pollutant loads in stormwater in the vicinity of the project site is anticipated over time, thereby reducing cumulative impacts.

Stormwater drainage generated by the project site would not cause an increase in the flow rate or volume of stormwater being discharged to the City's storm drain system; therefore, the proposed project would not have a cumulatively considerable impact on flooding, downstream erosion, or exceedance of storm drainage capacity.

The proposed project would not use, handle, store, or generate compounds or constituents contributing to the impaired status of San Francisco Bay, with the exception that trash would be generated during construction of the project. Implementation of Mitigation Measure HYDRO-1b, which would ensure appropriate waste collection practices during construction, would also ensure that trash generated during construction is not released into the environment. After project construction is completed, the generation and handling of trash would not change from the current condition at the project site, which includes appropriate trash collection facilities and disposal procedures to prevent the release of trash into the environment. The proposed project would therefore not have cumulatively considerable operation- or construction-related impacts on water quality.

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Stetson Engineers Inc., 2022. Hydraulic Design Basis for the Coastal Flood Barrier System of the Belvedere Critical Infrastructure Project.

4.10 LAND USE AND PLANNING

INTRODUCTION

The analysis of land use and planning generally considers the compatibility of a proposed project with neighboring areas, change to or displacement of existing uses, and consistency of the project with relevant local land use policies and regulations that have been adopted with the intent to mitigate or avoid an environmental effect. With respect to land use conflicts or compatibility issues, the magnitude of these impacts depends on how a proposed project affects the existing development pattern, development intensity, traffic circulation, noise, air quality, and visual setting in the project site vicinity. These topics are addressed throughout *Chapter 4, Environmental Setting, Impacts, and Mitigation Measures*, of this Environmental Impact Report (EIR).

This section considers whether the proposed project may conflict with applicable land use plans, policies, or regulations (including but not limited to the general plan and zoning ordinance) that were adopted for the purpose of avoiding or mitigating an environmental effect (see Appendix G of the California Environmental Quality Act [CEQA] Guidelines). This section also considers whether the proposed project could physically divide a community (see Appendix G of the CEQA Guidelines).

ENVIRONMENTAL SETTING

Regional Setting

The project site is located in the City of Belvedere in Marin County. Regional access to the site is from U.S. Highway 101 located west of the site and connected to Tiburon Boulevard located north and east of the site. The primary roadways that would be affected by the project are San Rafael Avenue and Beach Road. Both San Rafael Avenue and Beach Road connect to Tiburon Boulevard, a major arterial that connects the Tiburon Peninsula to U.S. Highway 101 and points north, south, and west.

Project Site Setting and Surrounding Land Uses

The project site is located in an area of mixed land uses, dominated by single-family and multi-family residences, with some commercial uses in the vicinity of Beach Road and recreational uses along both San Rafael Avenue and Beach Road. The Belvedere Lagoon, a private lagoon managed by the Belvedere Lagoon Property Owners Association (BLPOA), is located between San Rafael Avenue and Beach Road and is surrounded by private residences (see Figure 4.10-1).

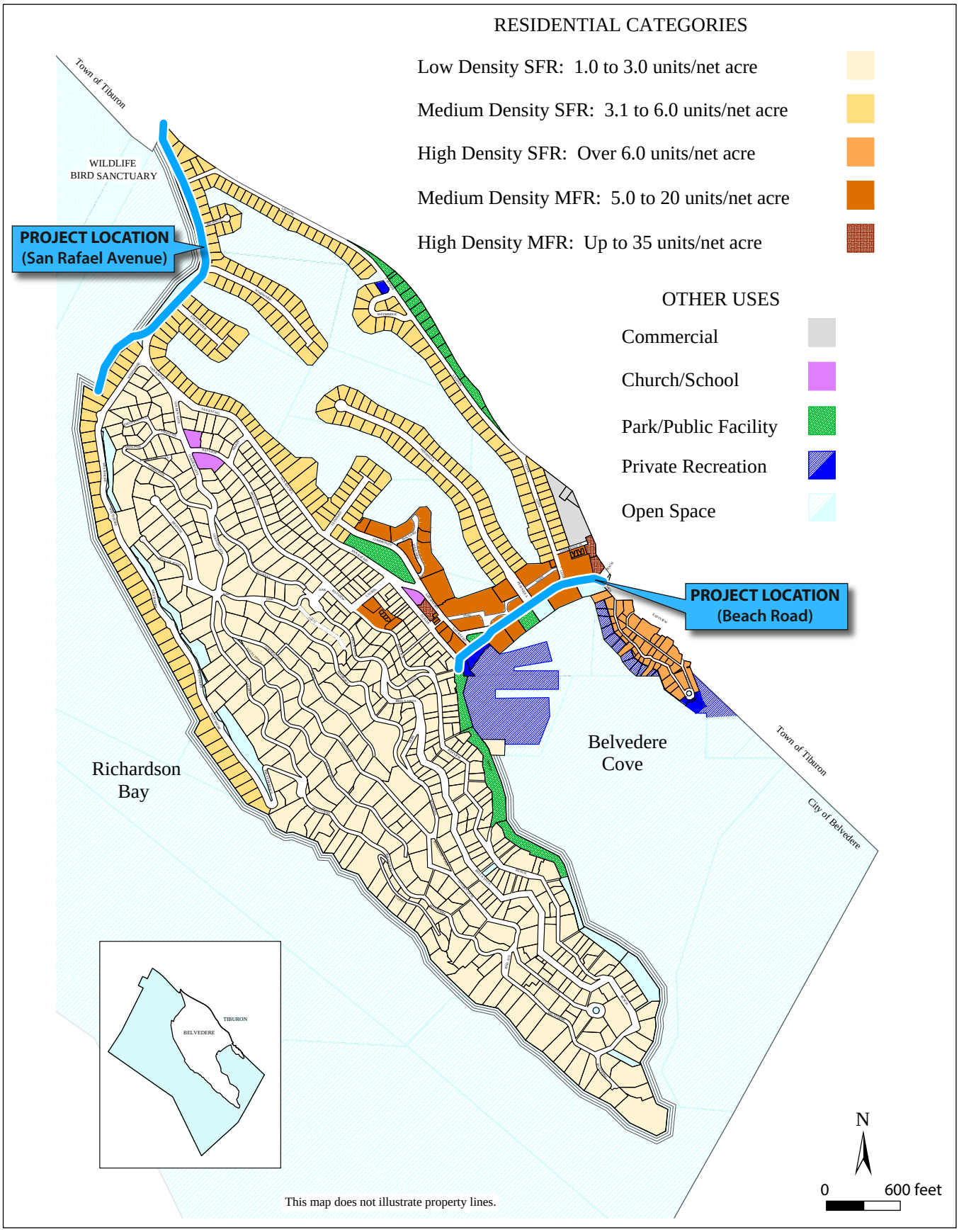

Figure 4.10-1

SOURCE: City of Belvedere, 2022

CITY OF BELVEDERE GENERAL PLAN

REGULATORY FRAMEWORK

Federal and State Regulations

No federal or state regulations related to land use apply to the project site.

Local Regulations and Policies

City of Belvedere General Plan

The City's General Plan (City of Belvedere, 2010) provides a comprehensive statement of the City of Belvedere's development policies. It covers all lands located within the City limits.

Land Use Designations

The land use designations for the city are illustrated in the General Plan map, which can be seen in Figure 4.10-1 (City of Belvedere, 2010). As shown in Figure 4.10-1, the project site is located along roadways where land use designations do not apply. The General Plan designates areas adjacent to the south side of San Rafael Avenue as Medium Density Single Family Residential (SFR) (3.1 to 6.0 units per net acre). This same designation applies to much of the area surrounding the Belvedere Lagoon, while the hillside residential area above and west of the project site is designated Low Density Single Family Residential (1.0 to 3.0 units per net acre). Along Beach Road, the south side includes General Plan designations of Medium Density Multi-Family Residential (5 to 20 units per net acre), Park/Public Facility, and Open Space. On the north side of Beach Road, designations are primarily Medium Density Multi-Family Residential (5 to 20 units per net acre). A small "island" of Park/Public Facility exists at the intersection of Beach Road and San Rafael Avenue.

Relevant Policies and Programs

The General Plan contains the following relevant policies and programs related to land use. Some of these and a variety of other General Plan policies are addressed in other sections of this Draft EIR, such as *Section 4.4, Cultural Resources, Section 4.6, Geology/Soils*, *Section 4.8, Hazards and Hazardous Materials*, and *Section 4.11, Noise*.

Policy HAZ-1.4 Ensure that the City is equipped for disaster, evacuation, and survival thereafter.

Action HAZ-1.4.2 Ensure that risk to public lifeline utilities, such as those along Beach Road and San Rafael Avenue, be reduced by installing excess flow valves, bracing, flexible materials, flexible joints and connections, joint restraint, strengthening of support structures, or other means.

Action HAZ-1.4.3 Ensure that lifeline utilities at risk of damage due to liquefaction be designed for easy access and repair, and consideration should be given to providing pre-designed replacement/repair fittings to allow rapid bridging of breaks at crucial locations where damage is anticipated.

Policy HAZ-3.5 Filled land that is underlain by compressible materials (bay mud, marsh, slough) should receive special attention during site planning.

Action HAZ-3.5.1 Soils investigations should include borings and sufficient examination to determine the location of former sloughs and other factors that would accentuate differential settlement. The investigation should delineate those areas where settlement will likely be greatest, subsidence will occur, etc., and should recommend the site preparation techniques that could be employed to preclude hazard.

Action HAZ 3.5.2 Any new construction in Bay margin areas shall carefully consider the potential effects of settlement both on the project and on adjacent properties. New construction can be supported on piles where appropriate.

Action HAZ 3.5.3 All new construction in Bay margin areas shall be designed with the guidance of a qualified geotechnical engineer in accordance with the applicable CBC.

Policy LU-1.4 Views from public spaces of the Bay, San Francisco, and the mountains are to be retained wherever possible.

Action LU1.4-1 The Zoning Ordinance includes provisions for the dedication of a view site or easement.

Policy LU-2.5 Review opportunities to repair or mitigate environmental hazards such a pyrophytic plants and trees, sub-standard retaining walls and foundations, hazardous site access and obstructions, and roadway repair at time of development review.

Belvedere Municipal Code (Zoning)

Title 19 of the Belvedere Municipal Code addresses zoning. The project site itself does not have specific zoning designations because the project would be located generally within or near public rights-of-way along the roadways of Beach Road and San Rafael Avenue. As shown in Figure 4.10-2, properties on the south side of San Rafael Avenue are zoned Residential (R-1L, which refers to the Lagoon Area). The R-1L district allows single-family dwellings, accessory dwelling units, junior accessory dwelling units, and accessory uses to single-family dwellings (City of Belvedere, 2022). Other uses such as transitional housing, small family day care facilities, and congregate housing are also allowed in the R-1L district.

In the vicinity of the Beach Road portion of the project, most properties on both the north and south sides of the road are zoned Planned Unit Development (PUD). Other zoning designations include Recreation (R), Open Space (O), and Residential (R-3) as shown in Figure 3-6. The R-3 district allows single-family dwellings, two-family dwellings, apartment courts, apartment houses, and multiple dwellings. Other uses are allowed with use permits (City of Belvedere, 2022).

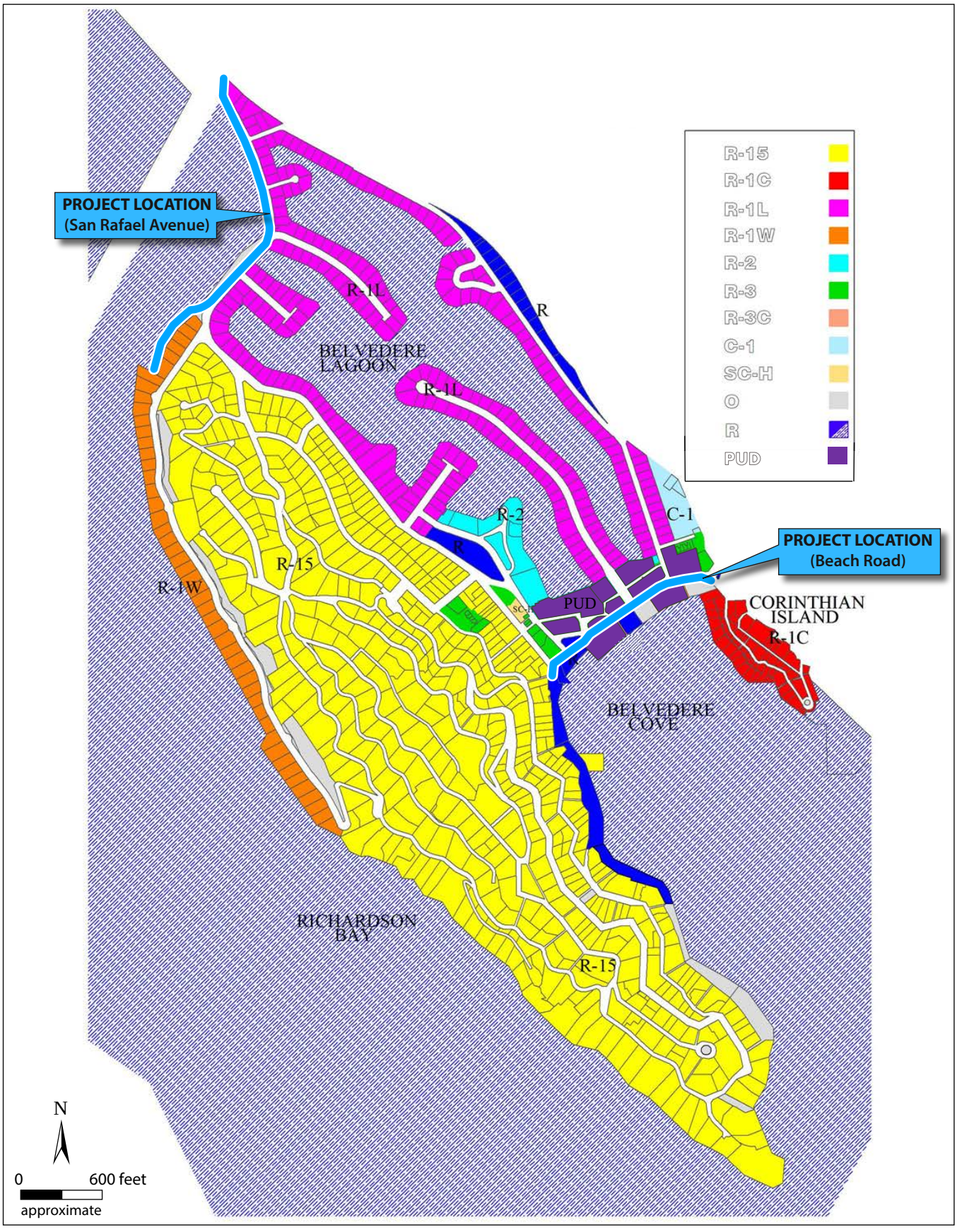

Figure 4.10-2

SOURCE: City of Belvedere, 2022

CITY OF BELVEDERE ZONING

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

For the purposes of this Draft EIR and based on Appendix G of the CEQA Guidelines, implementation of the proposed project would have a significant effect related to land use if it would:

1. Physically divide an established community; or
2. 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.

Conflicts with land use policies ultimately are to be determined by the City's decision-makers. While the Draft EIR can address potential conflicts, the City's decision-makers decide if the conflict is acceptable or not. Also, it is common for City policies to conflict. For example, there can be policies to encourage downtown commercial or office development for the purpose of economic development for the city, but that development may result in increased traffic. If the City has a policy to prevent excessive traffic impacts, there would be an inherent conflict. The Draft EIR authors have taken the liberty to identify what may be project conflicts with adopted policies, with an emphasis on those policies related to environmental issues. Some of these impacts could be significant and unavoidable if mitigation measures cannot adequately reduce the degree of the impact. However, the City decision-makers have to decide if the project warrants such impacts and this would be addressed at the time of findings being prepared to support the certification of the EIR and approval of the project..

Less-than-Significant Impacts

Physical Division of an Established Community

The project would not physically divide an established community.

The project would be located generally within or adjacent to the right-of-way of Beach Road and San Rafael Avenue. Following installation of the sheet piles, the site would be restored to its original condition and use. Thus, the project would not physically divide an established community, and the impact would be less than significant.

Conflicts with Land Use Plans, Policies, or Regulations

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.

The project would not conflict with land use policies of the City of Belvedere General Plan. Other sections of the EIR (e.g., *Section 4.4, Cultural Resources*, *Section 4.6, Geology/Soils*, *Section 4.8, Hazards and Hazardous Materials*, and *Section 4.11, Noise*) address potential conflicts related to protection of critical utilities and historic structures, hazards, and noise. The reader is referred to these other sections of the EIR.

Potentially Significant Impacts

No potentially significant land use impacts would be associated with the project.

Cumulative Impacts

This analysis evaluates whether impacts of the proposed project, together with impacts of other currently pending or approved projects, would result in a cumulatively significant impact with respect to land use, and specifically the significance criteria set forth above and found in Appendix G of the CEQA Guidelines. The analysis considers if the incremental contribution of the project impacts would be significant. The geographic context for this analysis is the City of Belvedere and nearby areas.

Approved and pending projects are shown in Figure 6-1 in *Chapter 6, Other CEQA Considerations*, of this EIR. As shown in Figure 6-1, the Mallard Pointe Project would be located between the two segments of the project, and the Flood Barrier Project would be in the same location as the proposed project. The project would not contribute to any cumulative land use impacts related to the two significance criteria addressed above because it would not divide an established community and any potential conflicts with policies would be resolved by the mitigation measures recommended for the project.

REFERENCES

City of Belvedere, 2010. City of Belvedere General Plan 2030. Adopted June 9.

City of Belvedere, 2022. Municipal Code, Title 19, March 14. Website: https://www.cityofbelvedere.org/DocumentCenter/View/281/Title-19---Zoning?bidId=, accessed August 26, 2022.

4.11 NOISE

INTRODUCTION

This section of the Draft Environmental Impact Report (EIR) assesses the potentially significant noise and vibration impacts that could result from implementation of the proposed project. This section also discusses the basics of environmental acoustics and vibration, applicable regulations of various agencies, and the existing noise environment in Belvedere. Mitigation measures to reduce significant impacts are identified, where appropriate.

ENVIRONMENTAL SETTING

This section provides background information on noise and vibration and summarizes the existing noise environment.

General Information on Noise

Noise is defined as unwanted sound that annoys or disturbs people and can have an adverse psychological or physiological effect on human health. Sound is measured in units of decibels (dB) on a logarithmic scale. Decibels describe the purely physical intensity of sound based on changes in air pressure but cannot accurately describe sound as perceived by the human ear, which is only capable of hearing sound within a limited frequency range. To better characterize noise levels perceived by a human ear, a decibel scale called A-weighting (dBA) is typically used. On this scale, the low and high frequencies are given less weight than the middle frequencies. Decibels and other acoustical and vibration terms are defined in Table 4.11-1. Typical A-weighted noise levels at specific distances are shown for different noise sources in Table 4.11-2.

In an unconfined space, such as outdoors, noise attenuates with distance. Noise levels at a known distance from a point source are reduced by 6 dBA for every doubling of that distance for hard surfaces (e.g., cement or asphalt) and by 7.5 dBA for every doubling of distance for soft surfaces (e.g., undeveloped or vegetative areas). Noise levels at a known distance from a line source (e.g., roads, highways, and railroads) are reduced by 3 dBA for every doubling of the distance for hard surfaces and 4.5 dBA for every doubling of distance for soft surfaces. Greater decreases in noise levels can result from the presence of intervening structures or buffers.

A typical method for determining a person's subjective reaction to a new noise is by comparing it to existing conditions. The following describes the general effects of noise on people (Charles M. Salter Associates,1998):

- A change of 1 dBA cannot typically be perceived except in carefully controlled laboratory experiments.
- A 3-dBA change is considered a just-perceivable difference.
- A minimum of 5-dBA change is required before any noticeable change in community response is expected.
- A 10-dBA change is subjectively perceived as approximately a doubling or halving in loudness.

TABLE 4.11-1 DEFINITIONS OF ACOUSTICAL TERMS

Term	Definition
Decibel (dB)	A unit describing the amplitude of sound on a logarithmic scale. Sound described in decibels is usually referred to as sound or noise "level." This unit is not used in this analysis because it includes frequencies that the human ear cannot detect.
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level (dBA)	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, in a manner similar to the frequency response of the human ear, and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
Maximum Sound Levels (L_{max})	The maximum sound level measured during a given measurement period.
Equivalent Noise Level (L_{eq})	The average A-weighted noise level during the measurement period. For this CEQA evaluation, L_{eq} refers to a 1-hour period unless otherwise stated.
Community Noise Equivalent Level (CNEL)	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels to sound levels during the evening from 7:00 AM to 10:00 PM and after addition of 10 decibels to sound levels during the night between 10:00 PM and 7:00 AM.
Day/Night Noise Level (L_{dn})	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to sound levels during the night between 10:00 PM and 7:00 AM.
Ambient Noise Level	The existing level of environmental noise at a given location from all sources near and far.
Vibration Decibel (VdB)	A unit describing the amplitude of vibration on a logarithmic scale.
Peak Particle Velocity (PPV)	The maximum instantaneous peak of a vibration signal.
Root Mean Square (RMS) Velocity	The average of the squared amplitude of a vibration signal.

Source: Charles M. Salter Associates, Inc., 1998; FTA, 2018.

TABLE 4.11-2 TYPICAL SOUND LEVELS MEASURED IN ENVIRONMENT AND INDUSTRY

Noise Source (Distance in Feet)	A-Weighted Sound Level in Decibels (dBA)
Jet Aircraft (200)	112
Subway Train (30)	100
Truck/Bus (50)	85
Vacuum Cleaner (10)	70
Automobile (50)	65
Normal Conversation (3)	65
Whisper (3)	42

Source: Charles M. Salter Associates Inc., 1998.

Because sound pressure levels are based on a logarithmic scale, they cannot be added or subtracted using linear methods. For instance, if one noise source emits a sound level of 90 dBA and a second source is placed beside it that also emits a sound level of 90 dBA, then the combined sound level is 93 dBA, not 180 dBA. In other words, doubling a sound source results in an increase of 3 dBA. When the second noise source is lower than the first noise source by at least 10 dBA, the contribution from the second noise source to the overall sound level is negligible (i.e., close to zero). In such cases, no adjustment factor is needed because the contribution from the lower noise source makes no perceptible difference in what people can hear or measure. For example, if one noise source generates a noise level of 95 dBA and another noise source is added that generates a noise level of 80 dBA, the higher noise source dominates, and the combined noise level will be 95 dBA.

Traffic noise levels are often expressed in terms of the hourly dBA. The noise levels generated by vehicular sources mainly depend on traffic volume, the speed, and the percent of trucks within the fleet. Increases in these three factors will lead to higher noise levels. As mentioned above, doubling the number of sources, such as traffic volume, increases the noise level by approximately 3 dBA due to the logarithmic nature of noise levels (FHWA, 2018).

General Information on 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 different methods are used to quantify vibration. Typically, groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors to vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment. Vibration amplitudes are usually expressed as either Peak Particle Velocity (PPV) or as Root Mean Square (RMS) velocity. PPV is appropriate for evaluating potential damage to buildings, but it is not suitable for evaluating human response to vibration because it takes the human body time to respond to vibration signals. The response of the human body to vibration is dependent on the average amplitude of a vibration event. Thus, RMS is more appropriate for evaluating human response to vibration. PPV and RMS are described in units of inches per second (in/sec), and RMS is also described in vibration decibels (VdB).

Groundborne vibration can transmit energy into buildings and structures. This vibration can cause a rumbling sound and audible noise within the buildings, which is referred to as groundborne noise. Like noise that travels through the air, groundborne noise is usually measured in decibels (dB or dBA). Groundborne noise is typically dominated by low-frequency components, and the non-linearity of human hearing causes sounds dominated by low-frequency components to seem louder than higher-frequency sounds with the same sound level. As a result, groundborne noise has the potential to disturb people at lower sound levels than broadband noise.

The relationship between groundborne vibration and groundborne noise depends on the frequency content of the vibration. For example, the groundborne noise measured in dBA will be approximately 40 dBA less than the groundborne vibration measured in VdB if the spectrum peak is around 30 Hz, and 25 dBA lower if the spectrum peak is around 60 Hz. Environmental vibration is rarely of sufficient magnitude to be perceptible or cause audible groundborne noise unless there is a specific vibration source close by, such as a railroad line.

Existing Noise Sources and Levels

Traffic along San Rafael Avenue and Beach Road is the primary source of noise at the project site. The existing noise environment in the vicinity of the project site was documented through six short-term (15-minute) ambient noise level measurements. The noise measurement locations are illustrated in Figure 4.11-1. The short-term noise measurements were taken on May 15, 2022, between 9:00 AM to 12:30 PM. These noise measurements document the daytime ambient noise conditions at the existing single-family residential developments adjacent to the project site and along the proposed haul truck routes. Sound level measurements were conducted using Type 1 sound level meters, using slow response and "A" weighting. The microphones were positioned at least 4 feet above ground level and protected from the effects of wind noises. The meter was field calibrated immediately prior to use. Ambient noise measurement locations, monitoring periods, and corresponding measured results are summarized in Table 4.11-3.

TABLE 4.11-3 EXISTING NOISE LEVEL MEASUREMENTS IN PROJECT SITE VICINITY

			Noise Levels (dBA)	
Site ID No.	Location Description	Monitoring Period	L_{eq}	L_{max}
ST-1	San Rafael Avenue at Windward Road, property line	10:24 AM – 10:39 AM	62.0	73.1
ST-2	Beach Road near the western project boundary, approximately 60 feet south of 83 Beach Road	11:11 AM – 11:26 AM	54.6	70.0
ST-3	Beach Road at Cove Road, parking lane	11:35 AM – 11:50 AM	55.2	75.0
ST-4	San Rafael Avenue at Leeward Road, property line (haul truck routes)	10:50 AM – 11:05 AM	56.6	71.5
ST-5	Tiburon Boulevard at San Rafael Avenue, 25 feet from roadway centerline (haul truck routes)	10:00 AM – 10:15 AM	71.8	81.9
ST-6	Tiburon Boulevard at Lyford Drive, 45 feet from roadway centerline (haul truck routes)	12:04 PM – 12:19 PM	72.2	85.6

Note: The Site ID corresponds to locations shown in Figure 4.11-1.

Noise-Sensitive Receptors

Noise-sensitive receptors are defined as land uses where noise-sensitive people may be present or where noise-sensitive activities may occur. Noise-sensitive receptors include residences, schools, churches, hospitals, elderly-care facilities, hotels, libraries, auditoriums, parks, and outdoor recreation areas. These land uses are generally more sensitive to noise than are commercial and industrial land uses. The nearest noise-sensitive receptors to the project site include (1) a single-family home located about 23 feet to the southeast of the proposed sheet pile location along San Rafael Avenue, (2) single-family homes adjacent to the proposed sheet pile locations in the Belvedere Lagoon area between Windward Road and Edgewater Road (proposed sheet pile located about 18 feet away from the building footprints), (3) single-family homes located about 10 feet to the southeast of the proposed sheet pile locations along Beach Road, and (4) the Belvedere Nursery School located 275 feet to the north of the proposed installation of sheet piles along Beach Road. Potential noise impacts on protected fish species and marine mammals are discussed in *Section 4.3, Biological Resources,* of this EIR and therefore are not addressed in this section.

Figure 4.11-1

NOISE MEASUREMENT LOCATIONS

SOURCE: Baseline Environmental Consulting, 2022

Vibration-Sensitive Receptors

The City's General Plan (City of Belvedere, 2010) does not provide a definition for vibration-sensitive receptors. According to the Federal Transit Administration (FTA), vibration-sensitive receptors (receptors where people or activities could be disturbed by vibration) can be divided into four categories (FTA, 2018):

1. Special Buildings: this category includes facilities that are very sensitive to vibration and noise, such as concert halls, TV and recording studios, and theaters;
2. Category 1, High Sensitivity: this category includes buildings where vibration levels would interfere with operations within the building, such as buildings where vibration-sensitive research and manufacturing is conducted, hospitals with vibration-sensitive equipment, and universities conducting physical research operations;
3. Category 2, Residential: this category includes all residential land uses and buildings where people normally sleep, and includes hotels and hospitals; and
4. Category 3, Institutional: this category includes institutions and offices that have vibration-sensitive equipment and have the potential for activity interference such as schools, churches, and doctors' offices.

Based on these categories, the nearby residential units are classified as Category 2 vibration-sensitive receptors and the Belvedere Nursery School located 275 feet to the north of the proposed installation of sheet piles along Beach Road is classified as a Category 3 vibration-sensitive receptor.

In certain situations, extreme vibration can cause minor cosmetic or substantial building damage. Historic buildings tend to be more susceptible to vibration (due to age and less modern construction techniques) depending on the condition of the buildings. There is one historic building, the China Cabin, located in the vicinity of the project site, about 25 feet to the southeast of the proposed sheet pile locations along Beach Road. The potential impact of project construction on the China Cabin and mitigation measures are discussed in *Section 4.4, Cultural Resources*, of this EIR. Potential vibration effects could also occur at other nearby buildings, which include several residential buildings adjoining the project site on Beach Road and San Rafael Avenue and the San Francisco Yacht Club located 25 feet to the southwest of the proposed sheet pile location along Beach Road.

REGULATORY FRAMEWORK

In California, noise is primarily regulated at the local level, through the implementation of general plan policies and local noise ordinances. The State of California provides guidance for the preparation of general plan noise elements. The purpose of a local general plan is to identify the general principles intended to guide land use and development, and cities and counties commonly adopt ordinances to specify the standards and requirements for implementing the principles of the general plan. Vibration is regulated at the federal and state level.

Federal Guidance for Noise

The Federal Transit Administration (FTA) has established a general construction assessment criterion of 90 dBA 1-hour L_{eq} at the nearest noise-sensitive receptor (FTA, 2018). According to the FTA, if the combined noise level in 1 hour from the two noisiest pieces of equipment exceeds 90 dBA at a residential land use (or other noise-sensitive receptors), then there may be a substantial adverse reaction.

State Regulations for Noise

Sections 46000 to 46080 of the California Health and Safety Code codify the California Noise Control Act of 1973. The act established the Office of Noise Control under the California Department of Health Services. It requires that the Office of Noise Control adopt, in coordination with the Office of Planning and Research, guidelines for the preparation of noise elements for general plans. The most recent guidelines are contained in the Office of Planning and Research's General Plan Guidelines (OPR, 2017). The document provides land use compatibility guidelines for cities and counties to use in general plans to reduce conflicts between land use and noise. The City of Belvedere has adopted a modified version of the state's land use compatibility guidelines, as discussed further below.

Local Regulations and Policies for Noise

City of Belvedere General Plan

The City's General Plan (City of Belvedere, 2010) includes the following policies that would apply to construction of the proposed project and were adopted for the purpose of avoiding or mitigating an environmental impact as related to noise issues:

Policy N-1.3 Minimize noise due to construction impacts.

Action N-1.3.1 Approval from the Building Permit and Planning Departments is required to be issued for all construction requirements in the City. The hours for construction shall continue to be limited from 8:00 a.m. to 5:00 p.m. Monday through Friday. The City Manager may, upon discretion, grant written exceptions to this condition whenever such work can be demonstrated to be necessary to protect the public's health and safety.

Action N-1.3.2 A noise control plan shall be reviewed as part of Design Review for all development applications involving pile driving or jack hammering.

Policy N-1.4 Minimize noise generated from outdoor uses and events such as exterior speakers, spa and pool equipment, roof-mounted exhaust fans, emergency generators, multiple air conditioning units, exterior inclined elevators, as well as infrequent loud noises such as pile driving that can be disturbing to nearby homes.

Action N-1.4.5 Erratic loud noise sources such as pile driving shall conform to the City's mandated construction hours of 8:00 a.m. to 5:00 p.m. on weekdays and shall not occur on weekends or City holidays.

Belvedere Municipal Code

The City of Belvedere's Noise Ordinance (Municipal Code Chapter 8.10) regulates noise within the city. The Noise Ordinance prohibits any person from making any noise that disturbs the peace and quiet of any neighborhood or that causes discomfort or annoyance to any reasonable person of normal sensitivity residing in the area. Per Section 8.10.040 of the Municipal Code, the prohibited noise generation includes the use or operation of any power tool or construction tool. The use of power or construction tools in connection with a valid building permit issued by the City must be subject to the terms and conditions and laws applicable to that permit.

Belvedere Municipal Code Section 16.04.030(B)(1) limits noise-generating construction activities and delivery of construction material to the hours between 8:00 AM and 5:00 PM. Monday through Friday. Noise-generating construction activities are prohibited on weekends and on City-recognized holidays. The City Manager may, upon their discretion, grant written exceptions to this condition whenever such work can be demonstrated to their satisfaction to be necessary to protect the public's health and safety; the City Manager's written permission must be obtained prior to any work being undertaken outside the prescribed hours.

Regulations and Guidelines for Vibration

United States Federal Transit Administration (FTA)

As shown in Table 4.11-4 below, the FTA has developed vibration thresholds to prevent disturbances to (i.e., annoyance of) building occupants based on the frequency of a vibration event. Human response to vibration often is described as the RMS velocity level, with units denoted in the decibel scale, or VdB.

TABLE 4.11-4 INDOOR GROUNDBORNE VIBRATION IMPACT CRITERIA – DISTURBANCE

	Groundborne Vibration Impact Levels (VdB)		
Land Use Category	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Special Buildings: Sensitive buildings that that are not included in the land use categories below.[d]	65-72	65-80	65-80
Category 1: Buildings where vibration would interfere with interior operations, such as vibration-sensitive equipment.	65	65	65
Category 2: Residences and buildings where people normally sleep (e.g., hotels and hospitals).	72	75	80
Category 3: Institutional land uses with primarily daytime use.	75	78	83

[a] More than 70 vibration events of the same source per day.
[b] Between 30 and 70 vibration events of the same source per day.
[c] Fewer than 30 vibration events of the same source per day.
[d] Special buildings include concert halls, TV studios, recording studios, auditoriums, and theatres.
Source: FTA, 2018.

California Department of Transportation (Caltrans)

Caltrans has developed vibration thresholds based on PPV values to evaluate the potential impact of construction vibration on structures. Construction vibrations that are equal to or exceed the vibration thresholds could result in potential damage to structures. Construction vibrations include transient sources (i.e., a single isolated vibration event), such as construction blasting, and continuous or frequent intermittent sources, such as impact pile drivers, vibratory pile drivers, and vibratory compaction equipment. The Caltrans vibration thresholds to prevent damage to buildings are presented in Table 4.11-5 below.

TABLE 4.11-5 VIBRATION THRESHOLDS FOR STRUCTURAL IMPACTS – DAMAGE

	Maximum PPV (In/Sec)	
Structure and Condition	Transient Sources	Continuous or Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: Caltrans, 2020.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Significance Criteria

In accordance with California Environmental Quality Act (CEQA) Guidelines Appendix G, the proposed project would cause a significant impact related to noise and vibration if it would:

1. Generate 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;
2. Generate excessive groundborne vibration or groundborne noise levels; or
3. 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, expose people residing or working in the project area to excessive noise levels.

Less-than-Significant Impacts

Aircraft Noise

The project would not expose people residing or working in the project area to excessive aircraft-related noise levels.

The project site is not located within the vicinity of a private airstrip or an airport land use plan, or within 2 miles of a public airport or public use airport. Therefore, the project would have no impact related to the exposure of people to excess noise levels from aircraft noise.

Noise from Construction-Related Traffic

Project construction traffic would not generate a substantial increase in ambient noise levels.

During construction, the increased traffic flow from the transport of workers, equipment, and materials to the project construction site would incrementally increase noise levels on local roads. As mentioned previously, doubling of the hourly traffic volume on roadway segments is typically necessary to cause a 3 dBA increase, which is considered a just-perceivable difference in noise levels. Project construction workers would be required to park their personal vehicles outside the City of Belvedere and be transported to and from the construction area via contractor-supplied vans or buses. The contractor-supplied van trips would not be expected to double the hourly traffic volumes along any roadway segment in the project vicinity. The City expects the project to generate approximately 3 haul truck trips per day on average during construction. Based on noise level modeling using the FHWA TNM Version 2.5 model (see Appendix E), these truck trips could generate noise levels of up to approximately 45.9 dBA L_{eq}.[1] As discussed above, the ambient noise levels in the project site vicinity range from approximately 55 to 72 dBA (see Table 4.11-3), which is more than 9 dBA louder than anticipated noise from project truck trips. The truck trips would result in a less than 1 dBA increase in ambient noise levels, making no perceptible difference in what people can hear. Consequently, the potential for construction truck trips to result in a substantial temporary increase in ambient noise levels is less than significant.

Noise from Project Operation

Once constructed, the project would not generate a substantial increase in ambient noise levels.

Once constructed, the proposed project would not generate noise, and therefore the potential of the proposed project to result in a substantial permanent increase in ambient noise levels in the vicinity of the project is less than significant.

Vibration from Project Operation

Once constructed, the project would not generate excessive groundborne vibration or groundborne noise levels.

Once constructed, the project would not cause any vibration or result in excessive vibration impacts, because no vibration-generating activities or land uses would occur on the project site. Therefore, there would be no impact related to operational vibration.

Potentially Significant Impacts

Impact NOISE-1: During project construction, use of construction equipment would generate a substantial temporary increase in ambient noise levels in the project vicinity in

[1] Numbers of truck trips and duration were provided by the project design team. Traffic noise model outputs are included in Appendix E. FHWA TNM Version 2.5 model was used for these results.

excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. (PS)

Construction activities would temporarily increase noise levels in the vicinity of the project site. The primary source of noise during construction would be operation of off-road equipment during construction on the project site. Construction noise levels would vary from day to day, depending on the number and type of equipment being used, the types and duration of activity being performed, the distance between the noise source and the receptor, and the presence or absence of barriers, if any, between the noise source and receptor. Pile driving, which can generate extreme levels of noise, is proposed as part of the project. Sheet piles would predominantly be driven using vibratory hammers, although impact hammers may need to be used in certain locations if the vibratory hammer is not sufficient to complete the installation. Noise levels generated by both scenarios are evaluated in this analysis.

The overall construction duration is expected to be approximately 8 months. Construction would first take place along San Rafael Avenue and take approximately 4 months to complete. Construction on Beach Road would take about 5 months to complete, and the first month of construction on Beach Road would occur simultaneously with the last month of construction on San Rafael Avenue. The use of a pile driver for installing sheet piles would last for approximately 2 months at each roadway location. Besides sheet pile installation, the construction of the project would also include the following activities: demolition of concrete and asphalt, starter trench excavation, concrete cap and backfill, and paving. Construction activities associated with the project would be conducted between 8:00 AM and 5:00 PM Monday through Friday. Occasionally, Saturday construction could occur with prior approval from the City. This is consistent with the requirement in the City of Belvedere's General Plan and Noise Ordinance, ensuring that the generation of construction noise would be limited to less noise-sensitive times of the day. However, construction activities could still generate noise exceeding ambient noise levels at nearby sensitive receptors.

Based on the information provided by the project design team, the types of construction equipment that would be used on the project site include an impact pile driver, vibratory pile driver, air compressors, compactors, excavators, cranes, loaders, pavers, rollers, concrete mixer trucks, and sweepers/scrubbers. Typical noise levels at 50 feet from various types of construction equipment are shown in Table 4.11-6.

The City of Belvedere Noise Ordinance does not establish noise criteria for assessing the impact of a construction project. Therefore, the FTA's general construction assessment criterion of 90 dBA 1-hour L_{eq} at the nearest noise-sensitive receptor is used in this analysis (FTA, 2018). According to the FTA, if the combined noise level in 1 hour from the two noisiest pieces of equipment exceeds 90 dBA at a residential land use (or other noise-sensitive receptors), then there may be a substantial adverse reaction.

In accordance with FTA guidance (FTA, 2018), construction noise impacts were evaluated by quantifying the maximum noise levels that would result from the simultaneous operation of the two noisiest pieces of equipment near the perimeter of the project site closest to a sensitive receptor during each construction activity. Noise calculations are included in Appendix E. The use of impact pile driving equipment would be limited to situations where the target depth cannot be

TABLE 4.11-6 TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Type of Equipment	Maximum Sound Levels (dBA at 50 Feet)
Pile Drivers (Impact)	101
Pile Drive (Sonic)	95
Rock Drill	95
Crane	88
Jackhammer	88
Grader	85
Paver	85
Dozer	85
Concrete Mixer	85
Truck	84
Compactor	82
Air Compressor	80

Source: FTA, 2018.

reached using other pile driving equipment. Because it is not known exactly where an impact pile driver could be used, the analysis assumes an impact pile driver could be used at any location along the alignment of the proposed sheet piles.

As shown in Table 4.11-7, the project's construction noise levels were estimated at the nearest noise-sensitive receptors along San Rafael Avenue and Beach Road for each construction phase. Pile driving with and without the impact pile driving method was included in the analysis. Based on this analysis, project construction would generate noise levels that exceed the 90 dBA L_{eq} threshold established by the FTA during sheet pile installation and other construction activities. The potential for the project to generate a substantial temporary increase in ambient noise levels in the project vicinity is considered a potentially significant impact.

To evaluate the extent of the noise impact, a buffer distance that would be needed to avoid exceeding the FTA construction noise thresholds was estimated for each construction activity. As presented in Table 4.11-7, noise from an impact driver and vibratory driver could exceed the 90 dBA L_{eq} threshold at residences located within 81 feet and 44 feet, respectively. The buffer distances for other construction activities are about 20 to 25 feet. It should be noted that the use of impact pile driving equipment would be limited to situations where the target depth cannot be reached using other pile driving equipment. It is expected that sheet pile installation would progress about 25 feet horizontally per workday, although the actual progress may vary (BK Cooper and City of Belvedere, 2022). As the construction progresses along the proposed sheet pile alignments, construction noise impacts at individual sensitive receptors would generally be limited in frequency and duration.

TABLE 4.11-7 POTENTIAL NOISE IMPACTS FROM PROJECT CONSTRUCTION EQUIPMENT

Construction Locations	Construction Activity	Distance to Nearest Residence (Feet)[a]	Potential Noise Levels at Nearest Residence (dBA)[a]	Buffer Distance to Construction Noise Threshold of 90 dBA L_{eq} (Feet)
San Rafael Avenue	Demolition	23	91	25
	Excavation	23	91	25
	Sheet Piling (Impact)	18	103	81
	Sheet Piling (Vibratory)	18	98	44
	Cap and Backfill	23	89	20
	Paving	23	90	24
Beach Road	Demolition	10	98	25
	Excavation	10	98	25
	Sheet Piling (Impact)	10	108	81
	Sheet Piling (Vibratory)	10	103	44
	Cap and Backfill	10	96	20
	Paving	10	97	24

[a] The nearest sensitive receptors along San Rafael Avenue are single-family homes located about 18 feet from the proposed sheet pile locations in the Belvedere Lagoon for pile driving. For other construction activities, the nearest sensitive receptor along San Rafael Avenue is a single-family home located about 23 feet to the southeast of the proposed sheet pile location. The nearest sensitive receptors along Beach Road for all construction activities are single-family homes located about 10 feet to the southeast of the proposed sheet pile installation location near the intersection of Beach Road and San Rafael Avenue.
Source: Noise calculations included in Appendix E.

Mitigation Measure NOISE-1: Noise reduction measures shall be implemented to reduce noise impacts related to project construction. Noise reduction measures shall include but are not limited to the following:

- *The contractor shall implement a site-specific noise reduction plan prepared by a qualified acoustical consultant to reduce construction noise impacts to the maximum extent feasible, subject to review and approval by the City of Belvedere. The plan shall identify site-specific pile driving noise reduction measures that must be implemented prior to and during all construction activities to ensure noise levels would not exceed the 90 dBA L_{eq} threshold at nearby residences.*
- *Temporary noise barriers shall be placed between the proposed construction activities and nearby receptors when feasible. A sound blanket system hung on scaffolding, or other noise reduction materials that result in an equivalent or greater noise reduction than plywood, may also be used. The composition, location, height, and width of the barriers during different phases of construction shall be determined by a qualified acoustical consultant and incorporated into the site-specific noise reduction plan for the project.*

- *Avoid impact pile-driving where feasible in noise-sensitive areas. Pre-drilling or the use of a vibratory pile driver or silent pile driver are quieter alternatives where the geological conditions permit their use.*
- *Noise-generating construction and demolition activities, including material and equipment deliveries, shall be limited to between the hours of 8:00 AM and 5:00 PM Monday through Friday. Occasionally, Saturday construction could occur with prior approval from the City.*
- *All construction equipment powered by internal combustion engines shall be properly muffled.*
- *Unnecessary idling of combustion engines shall be prohibited. Haul trucks shall not be allowed to idle for periods greater than 5 minutes, except as needed to perform a specified function such as concrete mixing.*
- *All stationary noise-generating construction equipment shall be located as far as practical from existing nearby residences and other noise-sensitive land uses. Such equipment shall also be acoustically shielded.*
- *Quiet construction equipment and technologies shall be selected whenever feasible. Motorized equipment shall be fitted with proper mufflers in good working order.*
- *Businesses and residents adjacent to the project site shall be notified in writing in advance of the proposed construction schedule before construction activities commence.*
- *The project contractor shall designate a "noise disturbance coordinator" responsible for responding to any local complaints about construction noise. The disturbance coordinator shall determine the cause of any noise complaint (e.g., starting too early, bad muffler, etc.) and shall require that reasonable measures be implemented to correct the problem (potentially including erection of a temporary noise barrier/wall). A telephone number for the disturbance coordinator shall be posted at the construction site.*
- *All of the above measures shall be required to be included in contract specifications.*

Implementation of Mitigation Measure NOISE-1 would reduce this impact to less than significant. (LTS)

Impact NOISE-2: Construction of the proposed project could generate excessive groundborne vibration. (PS)

The City of Belvedere has not adopted criteria for construction groundborne vibration impacts. In this EIR, the FTA and Caltrans vibration impact criteria are used to evaluate potential vibration impacts associated with implementation of the project. Table 4.11-4 and Table 4.11-5 summarize the vibration criteria established by the FTA and Caltrans to prevent disturbances to building occupants and to prevent damage to structures, respectively. Vibration impacts from the proposed project would be considered potentially significant if they would exceed the FTA's or Caltrans' recommended vibration thresholds.

Construction can result in varying degrees of ground vibration depending on the type of equipment and activity. The primary types of equipment that would generate ground vibration during project construction and the associated vibration calculations are included in Appendix E. To evaluate the project's potential vibration effects on nearby sensitive receptors, a buffer distance that would be needed to avoid exceeding the FTA and Caltrans construction vibration thresholds was estimated for each type of equipment. The estimated buffer distances for potential disturbance and building damage are summarized in Table 4.11-8 and Table 4.11-9, respectively.

TABLE 4.11-8 POTENTIAL VIBRATION DISTURBANCE FROM PROJECT CONSTRUCTION

	Residential Land Use (Where People Sleep)		Institutional Land Use (e.g., School Buildings)	
Equipment Type (Unit)	Buffer Distance to Disturbance Threshold (Feet)	Distance to Closest Receptors (Feet)	Buffer Distance to Disturbance Threshold (Feet)	Distance to Closest Receptor (Feet)
Pile Driver (Impact)	158	10	125	275
Pile Driver (Vibratory)	68		54	
Vibratory Roller	73		58	
Loaded Trucks	40		31	

Note: The following FTA threshold was used to calculate the buffer distances from construction equipment:
People – Maximum vibration threshold of 83 VdB for institutional land uses from infrequent construction events.
People – Maximum vibration threshold of 80 VdB for residences and buildings where people normally sleep from infrequent construction event. As nighttime work is not anticipated, vibration annoyance impacts on people within residential buildings related to nighttime construction would not occur.
Source: Noise calculations included in Appendix E.

TABLE 4.11-9 POTENTIAL VIBRATION DAMAGE TO BUILDINGS FROM PROJECT CONSTRUCTION

	Residential/Commercial Buildings			Historic Building (China Cabin)		
Equipment Type (Unit)	Building Damage Vibration Threshold[a] (In/Sec)	Buffer Distance to Damage Threshold (Feet)	Distance to Closest Receptor (Feet)	Building Damage Vibration Threshold[b] (In/Sec)	Buffer Distance to Damage Threshold (Feet)	Distance to Closest Receptor (Feet)
Pile Driver (Impact)	0.3	45	10	0.25	52	25
Pile Driver (Vibratory)	0.3	16		0.25	19	
Vibratory Roller	0.3	19		0.25	22	
Loaded Trucks	0.3	9		0.25	10	

[a] To be conservative, the Caltrans vibration threshold of 0.3 in/sec for older residential structures was used to calculate the buffer distances from construction equipment for the structures along San Rafael Avenue and Beach Road including the residential structures and the San Francisco Yacht Club.
[b] The Caltrans threshold vibration threshold of 0.25 in/sec for historic and some old buildings was used to calculate the buffer distances from construction equipment for the China Cabin.
Source: Noise calculations included in Appendix E.

Human Disturbance from Construction Vibration

There are two types of land uses near the project site that could be disturbed by construction vibration: residences where people normally sleep and a school building (i.e., institutional land use). The closest residential building to the project is about 10 feet away from the proposed sheet pile alignments along Beach Road. The closest school building to the project is the Belvedere Nursery School, which is located at least 275 feet from the proposed sheet pile alignment along Beach Road. As shown in Table 4.11-8, the impact pile driver would require the largest buffer distance to avoid generating vibration levels that could disturb residences or a school building. An impact pile driver would require a 158-foot buffer to avoid disturbing the sleep of nearby residents. As nighttime work is not permitted for the proposed project, vibration from project construction is not expected to disturb the sleep of nearby residents. Furthermore, the exposure of an individual residential receptor to construction vibration would generally be limited in duration as construction activities continue to progress linearly along the proposed sheet pile alignments. An impact pile driver would require a 125-foot buffer to avoid disturbing daytime school activities. Because the Belvedere Nursery School is located well outside the buffer distance, construction activities would not generate excessive vibration levels that could potentially disturb the normal school operations. As a result, construction activities would not generate excessive vibration levels that would disturb nearby residents and institutional land uses, and this impact would be less than significant.

Building Damage from Construction Vibration

There are three types of structures near the project site that could be damaged by construction vibration: residences, a commercial building (the San Francisco Yacht Club), and a historic building (the China Cabin). As shown in Table 4.11-9, the impact pile driver would require the largest buffer distance to avoid generating vibration levels that could damage nearby structures. An impact pile driver would require a 45-foot buffer to avoid damaging the residential/commercial buildings and a 52-foot buffer to avoid damaging the historic building.

As illustrated in Figure 4.11-2, there are six residential structures along San Rafael Avenue and six residential structures, the San Francisco Yacht Club, and the China Cabin along Beach Road that are located within the buffer distance of the impact pile driver for potential damage to structures. It should be noted that the use of impact pile driving equipment would be limited to situations where the target depth cannot be reached using other pile driving equipment. A vibratory pile driver would be used instead of the impact pile driver when feasible, which would reduce the buffer distance to 16 feet for the residential/commercial buildings and 19 feet for the historic building. However, to be conservative, it is assumed for this analysis that the impact pile driver may need to be used at any location along the alignment of the proposed sheet piles. As summarized in Table 4.11-9, it should also be noted that use of a vibratory driver or vibratory roller could potentially damage nearby residential/commercial structures within a buffer distance of 16 to 19 feet, respectively.

Construction of the project would have the potential to cause vibration damage to the historic building (China Cabin), the San Francisco Yacht Club, and the residential buildings along the project site on Beach Road and San Rafael Avenue, which is considered a potentially significant impact and requires mitigation. Mitigation measures that are specific to reducing vibration impacts on the China Cabin are provided in Mitigation Measure CULT-1a in *Section 4.4, Cultural Resources,* of this EIR and therefore are not included in Mitigation Measure NOISE-2.

Figure 4.11-2

SOURCE: Baseline Environmental Consulting, 2022

POTENTIAL VIBRATION DAMAGE TO STRUCTURES

Mitigation Measure NOISE-2: The following measures shall be implemented to reduce vibration impacts related to project construction:

- *Pre-Construction Survey. Prior to the start of any vibration-generating construction activity, the City of Belvedere shall engage a consultant to undertake a pre-construction survey of potentially affected buildings within 45 feet of the proposed sheet pile alignment, provided that the property owner approves of the survey. All pre-construction surveys of potentially affected buildings and/or structures shall be prepared by a structural engineer or other professional with similar qualifications. The pre-construction surveys shall include descriptions and photographs of both the exterior and interior of the buildings that could potentially be damaged during construction, including documentation of existing damage such as cracks and loose or damaged features. The pre-construction surveys shall be submitted to the City for review and approval prior to the start of vibration-generating construction activity.*
- *Avoid Impact Pile Driving Where Feasible. The use of impact pile driving equipment shall be limited to situations where the target depth cannot be reached using other pile driving equipment. The use of impact pile driving shall be prohibited within 45 feet of residential/commercial buildings to avoid potential vibration damage. When necessary, alternative methods, such as pre-drilling or excavation of soil to depths of up to approximately 10 feet, shall be performed prior to sheet pile installation to remove potential obstructions (e.g., large rocks) in the fill material of the levees to ensure that vibratory or silent pile driving methods will reach the target depth.*
- *Limited Use of Vibratory Pile Driving. The use of vibratory pile driving shall be prohibited within 16 feet of residential/commercial buildings to avoid potential vibration damage. When necessary, alternative methods, such as a silent pile driver, shall be used to ensure that construction vibration levels do not exceed the established standard. The silent pile driving method requires the use of vibratory pile driving to install the first few piles of a continuous sheet pile segment; therefore, the use of the vibratory pile driving to install the first few piles shall be performed in areas that are as far away as possible from the potentially affected buildings and/or structures.*
- *Limited Use of Vibratory Roller. The use of a vibratory roller shall be prohibited within 19 feet of residential/commercial buildings to avoid potential vibration damage. When necessary, alternative methods, such non-vibratory rollers or plate compactors, shall be used to ensure that construction vibration levels do not exceed the established standard.*
- *Vibration Management and Monitoring Plan. The contractor shall implement a monitoring plan prepared by a qualified engineer to avoid or reduce project-related construction vibration damage to adjacent buildings and/or structures and to ensure that any such damage is documented and repaired. The vibration management and monitoring plan shall apply to all potentially affected buildings and/or structures. The plan shall be submitted to the City for review and approval prior to the start of vibration-generating construction activity. The vibration management and monitoring plan shall include, but not be limited to, the following components:*
    - *Maximum Vibration Level. The plan shall establish a maximum vibration level that shall not be exceeded at each building/structure on adjacent properties. The maximum vibration levels shall be based on existing conditions, character-defining*

features, soil conditions, and anticipated construction practices (common standards are a peak particle velocity [PPV] of 0.25 inch per second for historic buildings, 0.3 inch per second for older residential structures, and 0.5 inch per second for new residential structures and modern industrial/commercial buildings).

- o *Buffer Distances. The plan shall identify the buffer distances to be maintained based on vibration levels and site constraints between the operation of vibration-generating construction equipment and the potentially affected building and/or structure, as presented in Table 4.11-9 of the Environmental Impact Report (EIR), to avoid damage to the extent possible.*
- o *Vibration Monitoring and Reporting. The plan shall lay out the method and equipment for vibration monitoring and develop reporting protocol for City review. To ensure that construction vibration levels do not exceed the established standard, the contractor shall monitor vibration levels at each affected building and/or structure on adjacent properties and prohibit vibratory construction activities that generate vibration levels in excess of the standard.*
- o *Alternative Construction Equipment and Techniques. The plan shall identify potential alternative equipment and techniques that could be implemented if construction vibration levels are observed in excess of the established threshold. Alternative construction equipment and techniques that can be used to reduce the vibration impact include, but are not limited to, the following:*
  - *Pre-drilling or excavation of soil to depths of up to approximately 10 feet.*
  - *Use of a static load piling system such as a silent pile driver.*
  - *Avoidance of vibratory rollers and packers near sensitive areas.*
  - *Use of smaller, lighter equipment.*
- o *Repairing Damage. The plan shall identify provisions to be followed should damage to any building and/or structure occur due to construction-related vibration. The building(s) and/or structure(s) shall be remediated by the City to their pre-construction condition at the conclusion of vibration-generating activity on the project site, provided that the property owner approves of the repair.*

- *Halting of Construction. Should construction vibration levels be observed in excess of those established in the plan, the contractor(s) shall halt construction and implement alternative construction techniques identified in the plan.*
- *Inspections and Damage Notifications. Any inspections of buildings and/or structures for potential damage shall be performed by a qualified engineer. If vibration has damaged nearby buildings and/or structures, the qualified engineer shall immediately notify the City.*
- *Vibration Monitoring Results Report. After construction is complete, the City shall receive a final report from the professionally registered historic architect or qualified historic preservation professional (for effects on historic buildings and/or structures) and/or structural engineer (for effects on historic and non-historic buildings and/or structures). The report shall include, at minimum, collected monitoring records, building and/or structure condition summaries, descriptions of all instances of vibration level exceedance, identification of damage incurred due to vibration, and corrective actions taken to restore damaged buildings and structures.*

- *For potential impacts to the historic China Cabin, implement Mitigation Measure CULT-1a.*

Implementation of Mitigation Measure NOISE-2 would reduce the potential for construction-generated vibration to cause damage to adjacent buildings to a less-than-significant level. (LTS).

Cumulative Impacts

This analysis evaluates whether the impacts of the project, together with the impacts of cumulative projects, would result in a cumulatively significant impact with respect to noise or vibration. This analysis then considers whether the incremental contribution of the impacts associated with the implementation of the proposed project would be significant. Both conditions must apply for a project's cumulative effects to rise to the level of a significant impact. For noise and vibration, the geographic scope for assessing cumulative impacts includes sources in the general vicinity of the project site. Noise and vibration dissipate with increased distance from the source; therefore, cumulative noise and vibration impacts would not be expected unless new sources of noise are in close proximity to each other.

The pending Mallard Pointe Project and Flood Barrier Project were considered in this cumulative impact analysis. (See *Chapter 6, Other CEQA Considerations,* of this EIR for more information on these pending projects.)

Mallard Pointe Project

The Mallard Pointe Project would be located at 1-22 Mallard Road about 2,450 feet from the San Rafael Avenue portion of the project and 750 feet from the Beach Road portion of the project. If construction of the Mallard Pointe Project were to occur concurrently with the project, which is the worst-case scenario, the noisiest phase of project construction could generate noise levels up to about 66 dBA[2] at the project site along Beach Road. These noise levels would be more than 10 dBA lower than the noise levels generated by typical construction equipment at the project site as summarized in Table 4.11-6. As noise dissipates with increased distance from the source, the impact at the San Rafael Avenue portion that is farther away would be lower than at the Beach Road portion. Therefore, the potential cumulative impact related to project construction noise during concurrent development of the Mallard Pointe Project would be less than significant.

As nighttime work is not anticipated for the project, vibration annoyance impacts on people within residential buildings related to nighttime construction would not occur. Therefore, the potential cumulative impact related to project construction vibration to cause disturbance during concurrent development of the Mallard Pointe Project would be less than significant.

With regard to the potential for construction vibration to cause damage, as discussed above, vibration dissipates with increased distance from the source. Because the Mallard Pointe Project would be located more than 750 feet away from the project site, concurrent development with the proposed project would not generate substantial vibration at the same building. Therefore, the potential for project construction vibration to cause damage in the event of concurrent development of the Mallard Pointe Project would be considered less than significant.

[2] It is conservatively assumed that the Mallard Pointe Project would generate similar noise levels as the project (e.g. pile driving will be used).

Floor Barrier Project

The Flood Barrier Project would provide for construction of flood barriers, such as walls and similar features to protect against flooding and sea level rise, within or adjacent to the project site in the future. Since sea wall development would not occur concurrently with the proposed project, the potential cumulative impact related to project construction noise and vibration would be less than significant.

REFERENCES

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4.12 PUBLIC SERVICES

INTRODUCTION

This section of the Draft Environmental Impact Report (EIR) describes the existing setting and the project's potential impacts on fire protection, police, schools, parks, and other public services.

ENVIRONMENTAL SETTING

Fire protection in Belvedere is provided by the Tiburon Fire Protection District. Police services are provided by the City of Belvedere Police Department. (Emergency response/evacuation and emergency access issues are addressed in *Section 4.8, Hazards and Hazardous Materials*, and *Section 4.14, Transportation/Traffic,* of this EIR.) The Reed Union School District and Tamalpais Union High School District serve Belvedere and other nearby communities. The City of Belvedere provides parks and other recreational facilities, as described in *Section 4.13, Recreation,* of this EIR. The Belvedere-Tiburon Library Agency oversees the Belvedere-Tiburon Library (PMC, 2010).

REGULATORY FRAMEWORK

No federal or state regulations related to fire protection, police, schools, parks, or other public services would apply to the project. No local regulations or policies, such as City of Belvedere General Plan policies, are relevant to the project's potential impacts on public services.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Significance Criteria

For the purposes of this Draft EIR and based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines, implementation of the project would have a significant effect on public services if it would:

1. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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: fire protection; police protection; schools; parks; or other public facilities.

For fire protection and police services, Appendix G further provides that a project would have a significant impact if it would:

1. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
2. Result in inadequate emergency access.

These emergency response/evacuation and emergency access issues are addressed in *Section 4.8, Hazards and Hazardous Materials*, and *Section 4.14, Transportation/Traffic,* of this EIR.

Less-than-Significant Impacts

Impacts from New or Altered Governmental Facilities

The project would not result in the need for new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection, police, schools, parks, or other public facilities. The project therefore would not result in substantial adverse physical impacts associated with the provision of such facilities.

The project provides for installation of sheet piles along San Rafael Avenue and Beach Road (see *Chapter 3, Project Description*, of this EIR). The project would not lead to any increases in population or other changes that would create additional demand for fire protection, police, schools, parks, or other public facilities or services. Therefore, no new or altered fire, police, school, park, library, or other public facilities would be needed to serve the project, and no related environmental impacts of constructing such facilities would occur. Any impacts on fire and police response times during project construction (e.g., due to work along San Rafael Avenue or Beach Road) would be temporary and would not create a need for new facilities. The project would not substantially change the level of use at parks or other recreational facilities in the vicinity (see *Section 4.13, Recreation*, of this EIR). The project's impact related to public facilities and services would therefore be less than significant, and no mitigation is necessary.

Potentially Significant Impacts

The project would not have any potentially significant impacts related to public services.

Cumulative Impacts

For public services, the scope for assessing cumulative impacts is the area within the Belvedere city limits and immediately surrounding areas that receive services from public agencies as described under *Environmental Setting* above. In Belvedere, approved or currently pending development includes (1) the Flood Barrier Project, which would provide for flood barrier improvements on the project site, and (2) the Mallard Pointe Project, which would replace 22 existing housing units with 42 new units, for a net increase of 20 housing units (see Figure 6-1 in *Chapter 6, Other CEQA Considerations*, of this EIR).

As discussed in the above project-specific analysis, the project would not result in a significant impact on public services or create the need for new or expanded public facilities. The project therefore would not result in or contribute to any significant cumulative public service impacts.

REFERENCES

PMC, 2010. *City of Belvedere Housing Element Update and General Plan Update Initial Study/Mitigated Negative Declaration*, prepared for the City of Belvedere, June 9, 2010, pages 4.0-110 through 4.0-112.

4.13 RECREATION

INTRODUCTION

This section of the Draft Environmental Impact Report (EIR) describes park and recreation facilities in the project site vicinity and the project's potential park and recreation impacts.

ENVIRONMENTAL SETTING

The City of Belvedere provides local parks and recreational facilities within Belvedere, including the 1.57-acre Community Park adjacent to City Hall; 1-acre Tom Price Park between Lagoon Road and Tiburon Boulevard; Centennial Park, a 5,265-square-foot public open space along lower Hawthorne Lane; Oak Mini-Park, a 1,162-square-foot public space at Oak Avenue and Buckeye Road; and the 8,600-square-foot Land Company Park, in the traffic island at the intersection of Beach Road and San Rafael Avenue in the Beach Road area of the project site (PMC, 2010).

At the project site, City recreational facilities include (1) the San Rafael Avenue walkway along the Richardson Bay shoreline, and (2) the Beach Road frontage on Belvedere Cove, adjoining the historic China Cabin operated by the Belvedere-Tiburon Landmarks Society. The City-owned Cove Beach shoreline, which was deeded to the City for public use, extends south from this point (City of Belvedere, 2010).

The San Francisco Bay Trail extends along Tiburon Boulevard east and north of the project site, as noted in *Chapter 3, Project Description*, of this EIR.

REGULATORY FRAMEWORK

There are no federal or state regulations that are relevant to the project's potential park and recreation impacts. No local regulations or policies, such as City of Belvedere General Plan policies, are relevant to the project's potential park and recreation impacts.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Significance Criteria

For the purposes of this Draft EIR and based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines, implementation of the project would have a significant effect on parks and recreational facilities if it would:

1. Increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
2. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

Less-than-Significant Impacts

Increased Use of Existing Parks or Other Recreational Facilities

The project would not increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

The project would not lead to any increases in population or other changes that would create additional demand for parks or other recreational facilities. Installation of the sheet piles may temporarily disrupt access to pedestrian sidewalks and pathways along Beach Road and San Rafael Avenue. After construction, however, the City would reconstruct in-kind any pedestrian sidewalks and pathways and landscaping damaged during installation. The project therefore would not cause substantial physical deterioration of existing neighborhood or regional parks or other recreational facilities. The impact on existing recreational facilities would be less than significant, and no mitigation is necessary.

Construction or Expansion of Recreational Facilities

The project would not include recreational facilities and would not require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

The project would not include recreational facilities and would not lead to any increases in population or other changes that would create a need for construction or expansion of recreational facilities. The impact would be less than significant, and no mitigation is necessary.

Potentially Significant Impacts

The project would not have any potentially significant impacts related to parks and recreation.

Cumulative Impacts

For parks and recreation, the scope for assessing cumulative impacts is the area within the Belvedere city limits and the immediately surrounding area, since these areas contain the parks and recreational facilities that are most likely to be used by local residents and employees. In Belvedere, approved or currently pending development includes (1) the Flood Barrier Project, which would provide for flood barrier improvements on the project site; and (2) the Mallard Pointe Project, which would replace 22 existing housing units with 42 new units, for a net increase of 20 housing units (see Figure 6-1 in *Chapter 6, Other CEQA Considerations*, of this EIR).

As discussed in the above project-specific analysis, the project would not result in a significant impact on recreational facilities or create the need for new or expanded facilities. The project therefore would not result in or contribute to any significant cumulative park and recreation impacts.

REFERENCES

City of Belvedere, 2010. *City of Belvedere General Plan 2030, Volume One: Goals, Policies, and Actions*, June 9, 2010, page 26.

PMC, 2010. *City of Belvedere Housing Element Update and General Plan Update Initial Study/Mitigated Negative Declaration*, prepared for the City of Belvedere, June 9, 2010, pages 4.0-116 through 4.0-117.

4.14 TRANSPORTATION/TRAFFIC

INTRODUCTION

This section of the Draft Environmental Impact Report (EIR) describes the existing transportation and circulation system, including roadway, bicycle, pedestrian, and transit facilities, in the vicinity of the project site; discusses project construction traffic; and determines the potential impacts of the project on the area transportation network. No changes to the transportation network are proposed as part of the project, and after installation of the proposed sheet piling, only a small number of vehicle trips related to maintenance would occur, similar to existing conditions. Thus, the project would not cause transportation impacts after construction, and therefore the transportation analysis focuses solely on the impacts of the construction phase of the project.

ENVIRONMENTAL SETTING

The project would take place in two locations in the City of Belvedere along the Bay's edge: along San Rafael Avenue for approximately 1,000 linear feet and along Beach Road for approximately 1,400 linear feet. Construction materials would be temporarily stored in on- and off-site staging areas, as described in *Chapter 3, Project Description*, of this EIR. This section describes the existing transportation system in the vicinity of the project site. Existing roadway operations are also summarized.

Roadway Network – Regional Roadways

Regional access to the construction staging areas would be provided by Tiburon Boulevard and U.S. Highway 101. Access between Tiburon Boulevard and U.S. Highway 101 is provided via the Tiburon Boulevard/East Blithedale Avenue interchange.

Tiburon Boulevard, under the jurisdiction of the California Department of Transportation (Caltrans), is also known as State Route (SR) 131 and generally runs east-west in the Town of Tiburon. Tiburon Boulevard connects Belvedere residents to commercial land uses, the Tiburon Ferry, U.S. Highway 101, and the greater Bay Area. The roadway is a two- to four-lane arterial roadway that extends from an interchange with U.S. Highway 101 through Tiburon and terminates at a connection to Paradise Drive. Average daily traffic volumes on Tiburon Boulevard are approximately 12,000 vehicles at its intersection with San Rafael Avenue.

Local Roadways

San Rafael Avenue is a two-lane arterial roadway that runs between Tiburon and Belvedere and provide access to Belvedere from Tiburon. Land uses on the east side of San Rafael Avenue are residential in nature and Richardson Bay is located on the west side of the roadway. The speed limit on San Rafael Avenue is 25 miles per hour. On-street parking is only permitted in some locations on the east side of the street.

Beach Road is a two-lane arterial roadway that also provides access between Belvedere and Tiburon. Land uses on both sides of the street are residential and include higher density apartment and condominium complexes. A landscaped median separates the travel lanes south of Cove Road. On-street parking is generally permitted in locations on both sides of the roadway.

West Shore Road is a two-lane neighborhood street that intersects with San Rafael Avenue and runs along the perimeter of Belvedere. West Shore Road provides access to single-family homes but does not provide through vehicular access beyond Belvedere Way. On-street parking is permitted on both sides of the roadway.

Bicycle Network

Bicycle paths, lanes, and routes are typical examples of bicycle transportation facilities, which are defined by Caltrans as being in one of the following four classes:

- Class I – a completely separated facility designed for the exclusive use of bicyclists and pedestrians. Crossing points are typically minimized.
- Class II – a restricted right-of-way designated lane for the exclusive or semi-exclusive use of bicycles. Through travel by motor vehicles is prohibited, but vehicle parking and cross-flows by pedestrians and motorists are permitted.
- Class III – a right-of-way designated by signs or permanent markings and shared with pedestrians and motorists.
- Class IV – an adjacent bicycle lane or bikeway that is physically separated from motor vehicle traffic.

There are no existing bicycle facilities located on or adjacent to the project site. The following bicycle facilities provide access to Belvedere from the Town of Tiburon, under whose jurisdiction they fall:

- Class I Pathway – the Richardson Bay Linear Park Multi-Use Path runs alongside Tiburon Boulevard from Blackie's Pasture to west of Mar West Street. This path is also known as Marin Bicycle Route 10.
- Class II Bicycle Lanes – Class II bicycle lanes extend along Tiburon Boulevard from Mar West Street (West) to Mar West Street (East).

Pedestrian Network

The roadway network within and adjacent to the project site generally includes sidewalks or walkways on at least one side of each local roadway described previously. Sidewalks are approximately 4 feet wide.

More specifically, continuous sidewalks are provided on both sides of San Rafael Avenue south of Lagoon Road. North of Lagoon Road, pedestrian facilities are provided via a walkway comprised of decompressed granite on the west (Bay) side of the roadway. The pathway provides a connection to the Class I facility on the south side of Tiburon Boulevard.

Pedestrian facilities are provided via sidewalks on both sides of Beach Road and along West Shore Road.

Transit System

Within the project site vicinity, one public transit stop is located at Beach Road and San Rafael Avenue. The stop serves Marin Transit route 219, with service from Tiburon to Strawberry. As of May 2022, the stop has been served by the westbound route only. There are seven arrivals per day on weekdays, with service confined to the AM and PM peak hours.

Other public transit stops serving both the westbound and eastbound Marin Transit route 219 are located on Beach Road and Tiburon Boulevard.

The public transit stop at Beach Road and San Rafael Avenue also serves Marin Transit route 619, which provides service between Tiburon and Belvedere and Redwood High School in Larkspur. There are two arrivals providing westbound service in the AM peak period, and three arrivals in the PM peak period.

Marin Transit routes 219 and 619 provide service to Belvedere on weekdays only.

The Tiburon Ferry Terminal is located approximately one-half mile from the project site along Beach Road. Current ferry service runs to and from San Francisco. As of April 2022, a total of seven ferries depart Tiburon each weekday, of which two depart in the AM peak period and two depart in the PM peak period. Seven ferries also arrive in Tiburon from San Francisco each weekday. Three ferries depart and arrive in Tiburon on weekends.

Additionally, late night ferry service on Thursdays, Fridays, and Saturdays, provided by Tideline Marine Group, began in February 2022. This service is based on demand and provides night trips between 6:45 and 11:30 PM between Tiburon and Pier 1.5 and Hyde Street Pier in San Francisco.

REGULATORY FRAMEWORK

State Agency Responsibilities (California Department of Transportation)

The California Department of Transportation (Caltrans) is charged with managing and maintaining the State of California's highway system. Caltrans directly manages more than 50,000 lane miles of state and federal highways, as well as over 12,000 highway bridges; permits more than 400 public-use airports; and operates three of the top five Amtrak intercity rail services. Caltrans' Strategic Management Plan (2020-2024) defines six primary overarching goals: Safety First, Cultivate Excellence, Enhance and Connect the Multimodal Transportation Network, Strengthen Stewardship and Drive Efficiency, Lead Climate Action, and Advance Equity and Livability in all Communities. Within the project site vicinity, Caltrans maintains SR 131 (Tiburon Boulevard).

Regional Agency Responsibilities (Metropolitan Transportation Commission)

The Metropolitan Transportation Commission (MTC) is the transportation planning, coordinating, and financing agency for the nine-county San Francisco Bay Area. MTC prepares a 25-year Regional Transportation Plan that guides funding priorities for regional development of mass transit, highway, airport, seaport, railroad, bicycle and pedestrian facilities.

Local Agency Responsibilities, Regulations, and Policies

Transportation Authority of Marin

The Transportation Authority of Marin (TAM) is a Joint Powers Agency established between Marin County and all cities within the county, including the City of Belvedere, to address Marin's unique transportation issues and to fulfill the legislative requirements of California Propositions 111 and 116 (approved in June 1990). As the Congestion Management Agency (CMA) for Marin County, TAM maintains the Congestion Management Plan (CMP) (Transportation Authority of Marin, 2019).

TAM's congestion management program monitors the county's local multimodal transportation network level of service on roadways, bicycle and pedestrian facilities, and transit services, and identifies improvements to the performance of these multimodal systems.

As identified by TAM in the Final Report 2019 CMP Update Marin County, regional roadways within the project site vicinity that are part of the CMP network include Tiburon Boulevard from Highway 101 to Main Street in Tiburon. Local cities and towns must consider the impacts of land use changes on the arterial level of service within the designated CMP network (Transportation Authority of Marin, 2019).

City of Belvedere General Plan

The City's General Plan (City of Belvedere, 2010) contains goals, policies, and programs that guide the City's land use and development policy. The plan addresses various state-mandated elements including but not limited to Transportation and Circulation, Land Use, Sustainability, and Environmental Hazards.

The Transportation and Circulation Element of the General Plan contains a range of policies and implementation programs designed to maintain or improve transportation circulation within Belvedere. Relevant policies and programs provided by the Circulation Element include the following:

Policy TC-1.2 Improvements made to streets should focus on (1) Improving the roadway safety, (2) Improving sight distance, (3) Improving pedestrian circulation and safety, and (4) Improving parking conditions rather than increasing roadway capacity.

Policy TC-1.3 Traffic generated by construction activities, service vehicles, tourists, and special events should be minimized.

Action TC-1.3.1 Construction traffic shall continue to be managed through the review and approval of Staging and Parking plans that are required at the issuance of building permits.

Policy TC-3.1 Augment existing bike facilities to accommodate more users.

Policy TC-4.4 Minimize congestion on Tiburon Boulevard.

Belvedere Municipal Code

The Belvedere Municipal Code contains sections related to transportation, including vehicles, traffic management, streets, sidewalks, and construction management.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Significance Criteria

For the purposes of this Draft EIR and based on the California Environmental Quality Act (CEQA) Guidelines, implementation of the proposed project would have a significant impact on transportation and traffic if it would:

1. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities;[1]
2. Conflict or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b);
3. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or
4. Result in inadequate emergency access.

Less-than-Significant Impacts

Consistency with Vehicle Miles Traveled Requirements

The proposed project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b).

Section 15064.3 of the CEQA Guidelines addresses the project-level vehicle miles traveled (VMT) analysis required under CEQA. Section 15064.3 Subdivision (b) addresses the requirements for certain project types that are non-capacity-increasing.

After installation of the proposed sheet piling, only a small number of vehicle trips related to maintenance would occur, similar to existing conditions. Thus, the project would not significantly increase vehicle trips associated with the project after completion under current CEQA requirements. The CEQA Guidelines indicate that projects that would reduce or have no impact on VMT can be presumed to cause a less-than-significant transportation impact.

Project construction would generate traffic from construction workers and materials delivery and off-haul. CEQA Guidelines Section 15064.3(b)(3) states that, for many projects, a qualitative analysis of construction traffic may be appropriate, rather than a quantitative analysis of the VMT impacts associated with the construction of a project. Vehicle trips made for construction purposes would be temporary, and any generated VMT would generally be minor and limited to construction equipment and personnel; the project would not result in long-term trip generation. Please see

[1] The project's transportation impacts would be primarily associated with construction. Construction impacts for all modes (vehicles, bicycles, pedestrians, transit) are described in Impact TRANS-1.

Impact TRANS-1 for a discussion of other potential construction-related transportation impacts of the project.

Transportation Hazards

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).

The project, when completed, would not alter existing traffic patterns on San Rafael Avenue or Beach Road. The project would not increase hazards due to a geometric design feature or incompatible uses. Roadway alignments would remain the same as prior to the project.

Emergency Access

The project would not result in inadequate emergency access for vehicles.

The project's potential to interfere with the use of San Rafael Avenue and Beach Road as emergency access routes for vehicles would be less than significant. (See also *Section 4.8, Hazards and Hazardous Materials*, of this EIR. In addition to access for emergency response vehicles, Section 4.8 also addresses emergency evacuation routes for pedestrians. Refer to Impact HAZ-1 and Mitigation Measure HAZ-1, which address impacts on pedestrian emergency evacuation during project construction and the need to maintain Belvedere Way as a pedestrian evacuation route.)

Soils beneath specific segments of San Rafael Avenue and Beach Road consist primarily of intermixed sands and Bay mud layers produced from the dredging process that established the Belvedere Lagoon and levee embankments. These layers are continually settling and are prone to liquefaction in an earthquake. In the event of an earthquake, the proposed sheet piles would stabilize the roads and allow for maintenance of emergency vehicle access. This is a key objective of the project. Therefore, once construction is completed, the project would improve emergency access.

Construction would be staged such that emergency access to Belvedere Island would always be maintained either via San Rafael Avenue or Beach Road. Generally, the construction along San Rafael Avenue would require closing one lane of traffic, with potential limited periodic closures of both traffic lanes. Similarly, construction along Beach Road would require closing one lane of traffic, with potential limited periodic closures of both lanes. Construction activities requiring lane closures would occur at different times on San Rafael Avenue and Beach Road; therefore, one of these roadways would always remain fully open to public traffic during construction of the project. While there could be temporary closure of both traffic lanes to normal public traffic on these roads, one lane would always remain available for emergency response and evacuation purposes. The portion closed for construction would only be closed for an appropriate distance on either end of the current construction work area.

Potentially Significant Impacts

Impact TRANS-1: Construction traffic would occur over an 8-month period and could conflict with Belvedere General Plan Policy TC-1.3, which states that "Traffic generated by construction activities, service vehicles, tourists, and special events should be minimized." (PS)

The overall schedule for construction activities associated with the project is based on an 8-month construction duration. Construction would begin on San Rafael Avenue and substantial completion of this work is expected to be achieved in 3 to 4 months. Construction would proceed on Beach Road after the substantial completion of work on San Rafael Avenue. Substantial completion on Beach Road would be expected to be achieved in another 3 to 4 months. The in-water installation of sheet piling on Beach Road is expected to be restricted to the period between July 1 through October 30.

During the approximate 8-month construction period, construction crews of between 5 to 15 employees would work on the site 5 days per week. Construction would take place between 8:00 AM to 5:00 PM on weekdays. Weekend construction activity is not anticipated and would only be permitted with prior approval from the City.

Contractor and sub-contractor employees would be required to park their personal vehicles outside of Belvedere and would be transported to and from the construction area via contractor-supplied vans or buses. The contractor would determine the location of the employee parking area(s).

Construction activities at both San Rafael Avenue and Beach Road would result in traffic control that would divide the roadways. One side of the roadway would be used for construction activities, and one lane would be for traffic. The portion closed for construction would only be closed for an appropriate distance on either end of the construction area. During construction activity, the traffic lane would be controlled by traffic control persons, signage, and traffic control devices, subject to approval of a traffic control plan by the City. Traffic control may be provided by solar-powered traffic signals on weekends and nights, pending prior approval from the City for work during this time.

Emergency response access would be maintained at all times, either via Beach Road or San Rafael Avenue.

Inbound transportation of materials would travel in a counter-clockwise direction, with trucks traveling east on Tiburon Boulevard from U.S. Highway 101 to San Rafael Avenue, turning left on Beach Road, and turning left on Tiburon Boulevard to head back to U.S. Highway 101. Outbound transportation of discarded materials would travel in the same pattern.

Construction work would be subject to the City of Belvedere's *Project Regulation Information Contractor Guidelines* (City of Belvedere, undated). Applicable regulations include the following:

- Construction hours are limited to 8:00 AM to 5:00 PM Monday through Friday only. This includes the warm-up of equipment and delivery of materials. Work is also prohibited on City-observed holidays. Violations of construction work hours would result in a stop work order that would be enforced by the Police Department and lifted only after approval from the Building Department.

- A Staging, Parking and Material Delivery Plan approved by the Police Chief or Public Works Manager is a condition of most building permits issued.
- Minimum of 10 feet of paved way must be left clear and unobstructed for free passage of other vehicles. The 10-foot "clear passage" also applies to construction material.

As described above, project construction activities would meet Belvedere Municipal Code requirements and *Project Regulation Information Contractor Guidelines*. However, project construction traffic could still cause temporary disruption and delays to drivers, pedestrians, and bicyclists, and could conflict with Belvedere General Plan Policy TC-1.3, which calls for traffic generated by construction activities to be minimized. This would be a potentially significant impact.

> *Mitigation Measure TRANS-1a: The contractor shall produce a Traffic Control Plan (TCP) for construction activities that abides by the City of Belvedere's provisions regarding transportation and parking management during construction activities. The TCP shall be consistent with the latest edition of the California Manual on Uniform Traffic Control Devices (CA MUTCD).*
>
> *The TCP developed for the project shall coordinate construction activities in the area to maintain shuttle access to the off-site parking areas; maintain vehicle, pedestrian, and bicyclist access; and provide detours, as appropriate, for drivers, pedestrians, and bicyclists.*
>
> *Mitigation Measure TRANS-1b: The TCP shall be prepared by the contractor and approved prior to the issuance of an encroachment permit by the Police Chief or City of Belvedere Public Works Manager.*
>
> *Mitigation Measure TRANS-1c: The TCP shall, at a minimum, include the following provisions:*
>
> - *Based on the daily volume of on-haul, the timing of trucks shall be adjusted to limit/minimize hauling activities during peak traffic hours.*
> - *Whenever the contractor's operations affect normal conditions for traffic or for public access, the contractor shall furnish, erect, and maintain, at its expense, all fences, barricades, lights, signs, and other devices necessary to prevent collisions or damage or injury to the public.*
> - *Construction area signs shall be furnished, installed, maintained, and removed when no longer required, in accordance with the provisions of Caltrans' Section 12 of the "State Specifications for Temporary Traffic Control" and any requirements of the special provisions.*
> - *The contractor shall furnish flaggers and guards necessary to give adequate warning to traffic and to the public of construction conditions. Flaggers and guards assigned to direct traffic or to warn the public of construction conditions shall perform their duties, and shall be provided with the necessary equipment, in accordance with the current edition of the Caltrans publication "Instructions to Flaggers." The equipment shall be furnished and kept clean and in good repair by the contractor. Signs, lights, flags, and other warning and safety devices shall conform to the requirements set forth in the current Caltrans "Manual of Traffic Controls for Construction and Maintenance Work Zones."*

- *No material or equipment shall be stored where it will interfere with the free and safe passage of public traffic, including in pedestrian walkways, and at the end of each day and at other times when construction operations are suspended for any reason, the contractor shall remove all equipment and other obstructions from that portion of the roadway open for use by public traffic.*
- *Construction activity shall not result in the closure of existing pedestrian sidewalks/ walkways, bicycle facilities, or public transit facilities. The contractor shall provide safe, clearly identifiable and separated pedestrian pathways, per the California Manual on Uniform Traffic Control Devices (CA MUTCD). Signs and barricades shall be required to direct pedestrians through or around the construction work zones and shall be shown on the TCP. More specifically, any sidewalk or walkway closure, or any other work that does not provide a continuous 4-foot-wide clear path of travel on the same side of the street, shall result in the identification of a marked detour route for pedestrians. Detours shall include pedestrian separation from moving vehicles by cones, k-rails, or another form of physical separation. The barriers must be provided and maintained at all times. Sidewalks and walkways shall not be closed in the middle of the block as this generally results in pedestrians having to walk around the work site, usually into the street, to continue down the sidewalk. The contractor shall be required to post and maintain the appropriate pedestrian signs, including "SIDEWALK CLOSED AHEAD / USE OTHER SIDE," "SIDEWALK CLOSED," "NO PEDESTRIAN CROSSING," and "USE CROSSWALK."*

Mitigation Measure TRANS-1d: The contractor shall obtain authorization from Marin Transit and Golden Gate Transit if construction requires the temporary closure of any existing bus stops. If required by the transit agencies, the contractor shall establish temporary bus stops with appropriate passenger amenities during the construction period.

Mitigation Measure TRANS-1e: The contractor shall maintain all existing bicycle routes. During construction, temporary bike facilities may be delineated by cones, but the contractor shall maintain a clear and clean path of travel for bicyclists at all times. A bike route detour may be provided pending approval from the City. Signs such as "Bicyclists Allowed Full Use of Lane" or "Bicycle Route Detour" signs shall be posted.

Implementation of Mitigation Measures TRANS-1a through TRANS-1e would ensure that the potential impact related to conflict with Belvedere General Plan Policy TC-1.3 would be less than significant. (LTS)

Cumulative Impacts

This analysis evaluates whether the impacts of the proposed project, together with the impacts of other currently pending or approved projects, would result in a cumulatively significant impact with respect to transportation. The analysis then considers whether or not the incremental contribution of the impacts associated with the implementation of the proposed project would be significant. Both conditions must apply for a project's cumulative effects to rise to the level of a significant impact. The geographic context for this analysis is the City of Belvedere and nearby areas.

As discussed above, the only impacts associated with the project would be related to construction traffic. No operation-related traffic impacts would occur. In Belvedere, approved or currently

pending development includes (1) the Flood Barrier Project, which would provide for flood barrier improvements on the project site; and (2) the Mallard Pointe Project, which would replace 22 existing housing units with 42 new units, for a net increase of 20 housing units (see Figure 6-1 in *Chapter 6, Other CEQA Considerations*, of this EIR). It is assumed that the construction of both the Mallard Pointe Project and the Flood Barrier Project would occur after the proposed project and that there would be no cumulative construction-related impacts. Even if construction of the Mallard Pointe Project were to occur simultaneously with the proposed project, the mitigation measure recommended for the project would reduce any cumulative impact to less than significant.

REFERENCES

City of Belvedere, 2010. City of Belvedere General Plan 2030, Adopted June 9.

City of Belvedere, 2022. Municipal Code.

City of Belvedere, Undated. Project Regulation Information Contractor Guidelines.

Transportation Authority of Marin (TAM), 2019. Congestion Management Plan (CMP).

4.15 TRIBAL CULTURAL RESOURCES

INTRODUCTION

This section of the Draft Environmental Impact Report (EIR) describes the affected environment and regulatory setting and considers and evaluates the potential impacts of the project on tribal cultural resources (TCRs) in the project area. The analysis of the potential environmental impacts related to TCRs is derived primarily from the following sources and agencies:

- California Native American Heritage Commission (NAHC) Sacred Lands File Search, March 27, 2022;
- ECORP Consulting, Inc.'s 2022 Cultural Resources Inventory and Evaluation for the Critical Infrastructure Project, Marin County, California (ECORP, 2022);
- Ethnographic overviews of the Coast Miwok (Kroeber, 1925, 1936; Kelly, 1978); and
- Confidential tribal consultation record conducted under Assembly Bill (AB) 52.

Regional pre-contact information of the California Native Americans is discussed in *Section 4.4, Cultural Resources*, of this EIR. The reader is referred to that section for more information on California Native Americans prior to contact with European Americans (pre-contact time period).

ENVIRONMENTAL SETTING

Prior to the arrival of European Americans in the region, indigenous groups speaking more than 100 different languages and occupying a variety of ecological settings inhabited California. Kroeber (1925, 1936), and others (i.e., Driver, 1961; Murdock, 1960), recognized the uniqueness of California's indigenous groups and classified them as belonging to the California culture area. Kroeber (1925) further subdivided California into four subculture areas: Northwestern, Northeastern, Southern, and Central.

When the first European explorers entered the regions between 1772 and 1821, an estimated 100,000 people, about one third of the state's native population, lived in the Central Valley (Moratto, 1984:171). At least seven distinct languages of Penutian stock were spoken among these populations: Wintu, Nomlaki, Konkow, River Patwin, Nisenan, Miwok, and Yokuts. Common linguistic roots and similar cultural and technological characteristics indicate that these groups shared a long history of interaction (Rosenthal et al., 2007). The Central area (as defined by Kroeber, 1925) encompasses the project area and includes the Miwok.

Ethnographically, the project area is in the northeastern portion of the territory occupied by the Penutian-speaking Coast Miwok. Overall, Miwok had two distinct groups, consisting of the Lake Miwok and the Coast Miwok, which shared linguistic characteristics. The Coast Miwok's territory consisted of an area bound by Bodega Bay in the northwest, Glen Ellen in the northeast, and following the Sonoma River south to San Pablo Bay. San Pablo Bay makes up the southeastern boundary down to Sausalito, while the Pacific Ocean is the western boundary. The territories to the

north were inhabited by the Pomo, Wappo to the northeast, Patwin to the east, and Costanoan in the southeast (Kelly, 1978).

Subsistence of the Coast Miwok consisted of a wide variety of plants, seafood, and game found near the sea as well as inland. Due to the Miwok's diversified terrain, they were well-rounded in game hunting, fishing, and foraging, adapting to what was plentiful at different times of the year. During the winter months there was a heavy reliance on geese and dried stored foods such as acorns, kelp, and seeds. Salmon running in the winter were also caught using circular dip nets, weirs, and spears. During the summer, larger game such as deer, bear, and elk were hunted in the hills. Summer also gave way to plant gathering, which was used to offset the winter months when large game was scarce (Kelly, 1978).

REGULATORY FRAMEWORK

Federal and State Regulations

National Historic Preservation Act (NHPA)

The federal law that covers cultural resources that could be affected by federal undertakings (i.e. USACE 404 or 408 permit) is the National Historic Preservation Act (NHPA) of 1966, as amended. Section 106 of the NHPA requires that federal agencies consider the effects of a federal undertaking on properties listed in or eligible for the National Register of Historic Places (NRHP). The agencies must afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on the undertaking. A federal undertaking is defined in 36 Code of Federal Regulations (CFR) 800.16(y) as follows:

> A federal undertaking means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license, or approval.

The regulations that stipulate the procedures for complying with Section 106 are in 36 CFR 800. The Section 106 regulations require:

- Definition of the Area of Potential Effect (APE);
- Identification of cultural resources within the APE;
- Evaluation of the identified resources in the APE using NRHP eligibility criteria;
- Determination of whether the effects of the undertaking or project on eligible resources will be adverse; and
- Agreement on and implementation of efforts to resolve adverse effects, if necessary.

National Register of Historic Places (NRHP)

The NRHP is the official list of the Nation's historic places worthy of preservation. Authorized by the NHPA of 1966, the NRHP is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archaeological resources. To

be considered eligible, a property must meet the NRHP eligibility criteria. This involves examining the property's age, integrity, and significance (NPS, 2022).

Effects on a cultural resource are potentially adverse if the lead federal agency, with concurrence from the State Historic Preservation Officer (SHPO), determines the resource eligible for the NRHP, making it a "historic property," and if application of the Criteria of Adverse Effects (36 CFR 800.5[a][2] et seq.) results in the conclusion that the effects will be adverse. The NRHP eligibility criteria, contained in 36 CFR 63, are as follows:

> The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess aspects of integrity of location, design, setting, materials, workmanship, feeling, association, and
>
> (A) is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
>
> (B) is associated with the lives of persons important in our past;
>
> (C) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
>
> (D) has yielded, or may be likely to yield, information important in prehistory or history.

In addition, the resource must be at least 50 years old, barring exceptional circumstances (36 CFR 60.4). Resources that are eligible for, or listed on, the NRHP are "historic properties."

State of California Assembly Bill 52

Effective July 1, 2015, Assembly Bill (AB) 52 amended the California Environmental Quality Act (CEQA) to require that (1) a lead agency provide notice to those California Native American tribes that requested notice of projects proposed by the lead agency, and (2) for any tribe that responded to the notice within 30 days of receipt with a request for consultation, the lead agency must consult with the tribe. Topics that may be addressed during consultation include TCRs, the potential significance of project impacts, type of environmental document that should be prepared, and possible mitigation measures and project alternatives.

Pursuant to AB 52, Section 21073 of the Public Resources Code (PRC) defines California Native American tribes as "a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of the Statutes of 2004." This includes both federally and non-federally recognized tribes.

Section 21074(a) of the PRC defines TCRs for the purpose of CEQA as:

1. Sites, features, places, cultural landscapes (geographically defined in terms of the size and scope), sacred places, and objects with cultural value to a California Native American tribe that are any of the following:
    a. included or determined to be eligible for inclusion in the California Register of Historical Resources; and/or,

b. included in a local register of historical resources as defined in subdivision (k) of Section 5020.1; and/or,

c. 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 Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

Because criteria a and b also meet the definition of a "historical resource" under CEQA, a TCR may also require additional consideration as a historical resource. TCRs may or may not exhibit archaeological, cultural, or physical indicators.

Recognizing that California tribes are experts in their TCRs and heritage, AB 52 requires CEQA lead agencies to provide tribes that requested notification an opportunity to consult at the commencement of the CEQA process to identify TCRs. Furthermore, because a significant effect on a TCR is considered a significant impact on the environment under CEQA, consultation is used to develop appropriate avoidance, impact minimization, and mitigation measures.

In accordance with Section 21082.3(c)(1) of the PRC:

> … information, including, but not limited to, the location, description, and use of the tribal cultural resources, that is submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with subdivision (r) of Section 6254 of, and Section 6254.10 of, the Government Code, and subdivision (d) of Section 15120 of Title 14 of the CCR, without the prior consent of the tribe that provided the information.

Therefore, the details of tribal consultation summarized herein are provided in a confidential administrative record and are not available for public disclosure without written permission from the tribes.

Local Regulations and Policies

The City of Belvedere General Plan (City of Belvedere, 2010) contains the following policies that would apply to the project and were adopted for the purpose of avoiding or mitigating an environmental impact as related to cultural resource issues:

Goal Pres-1 Demonstrate an appreciation of the historic and cultural landmarks that remind residents and visitors of Belvedere's unique culture and history through activities, materials and procedures that recognize valuable historic resources and plan for their preservation.

Policy Pres-1.3 Promote awareness of prehistoric resources in Belvedere. Support the development of educational materials that highlight Belvedere's history prior to urbanization. Provide information about known prehistoric resources (both archaeological and FIGR [Federated Indians of Graton Rancheria] cultural resources) on properties at time of resale through Residential Building Reports.

Goal Pres-3	Demonstrate sensitivity to Belvedere's prehistoric past by establishing formal procedures for minimizing and mitigating impacts to archaeologically and culturally significant resources.
Policy Pres-3.1	Continue to protect cultural, archaeological, and paleontological resources.
Action Pres-3.1.1	Encourage property owners who have encountered archaeological or cultural resources on their parcel to avoid the resource if at all possible, followed by minimizing the impact to the resource, and resource relocation as a last option.
Action Pres-3.1.2	Require that all archaeological or cultural resource surveys or reports be filed with the Northwest Information Center (NWIC) at the conclusion of the work.
Action Pres-3.1.3	Develop a standard set of archaeological and cultural resource conditions of approval that can be applied to all new development projects that will apply in the event of a discovery.
Action Pres-3.1.4	Develop standard mitigation measures that, when complied with, can reduce the impacts to archaeological or cultural resources to a less-than-significant level.
Action Pres-3.1.5	Locate and design development to avoid impacts on sites with identified archaeological resources by placing structures to avoid the site, incorporating the site into a permanent open space area, covering the site with a layer of soil, deeding the site as a permanent conservation easement, or taking other actions recommended by the archaeologist, as approved by the City.
Action Pres-3.1.6	In the event unanticipated paleontological resources are uncovered during construction, all work must be halted and an evaluation must be undertaken by a qualified paleontologist to identify the appropriate mitigation for the feature.
Policy Pres-3.2	Continue to consult with the Federated Indians of Graton Rancheria on issues of mutual concern such as the continued preservation of Native American cultural resources, as well as when amending the General Plan, adopting or amending a Specific Plan, designating open space, and at any other times as required by State Law.
Action Pres-3.2.1	Develop and implement consultation protocols with the Federated Indians of Graton Rancheria for the review of development proposals. The protocols should include thresholds for requiring FIGR monitoring or involvement in project review.
Policy Pres-3.3	Create and maintain tools to alert residents and City Staff of the potential existence of archaeological and cultural resources, including a Prehistoric Resource Sensitivity Map. When receiving a development application, Staff shall consult the Sensitivity Map to determine the potential presence of historic and/or prehistoric resources.

Action Pres-3.3.1 Maintain an up-to-date Prehistoric Resource Sensitivity Map. Utilize the map to develop protocols for development proposals that involve ground disturbance, such as:

- High sensitivity parcels: Require test borings or test excavations, and consultation with the Federated Indians of Graton Rancheria. Potential need for a complete resource survey, data recovery, archaeological monitor and Native American monitor on-site, and a monitoring plan.
- Medium sensitivity parcels: Inform property owner of the potential need for test borings or test excavations if site inspections or ground disturbance yields potential evidence of archaeological or cultural resources. Presence of midden soil may be evidence of archeological or cultural resources.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Methods of Analysis

Tribal Notification and Consultation

As summarized above, CEQA, as amended in 2014 by AB 52, requires that a lead agency provide notice to any California Native American tribes that have requested notice of projects subject to CEQA review, and consult with tribes that responded to the notice within 30 days of receipt with a request for consultation. For the City of Belvedere, these include the Federated Indians of Graton Rancheria (FIGR) and the Torres Martinez Band of Desert Cahuilla Indians.

Within 14 days of initiating CEQA review for the project, on January 28, 2022, the City sent project notification letters to these tribes. In accordance with PRC Section 21080.3.1(d), the notification letters provided each tribe with a brief description of the project and its location, the contact information for the City's authorized representative, and a notification that the tribe has 30 days to request consultation. The 30-day response window closed on February 27, 2022. Below is a summary of the tribal consultation under AB 52. Information provided by consulting tribes that is considered confidential by a tribe is documented separately in a tribal consultation record with the City that is restricted from public distribution by PRC Section 21082.3(c)(1).

Torres Martinez Desert Cahuilla Indians

The Torrez Martinez Desert Cahuilla Indians did not respond to the City's notification letter; therefore, the threshold for carrying out tribal consultation with that tribe under PRC Section 21080.3.1(e) was not met and no further consultation was required under AB 52.

Federated Indians of Graton Rancheria

On February 10, 2022, the City received a response from Tribal Historic Preservation Officer Buffy McQuillen, formally requesting consultation on the project. The letter requested the opportunity to discuss project alternatives, mitigation measures, significant effects the project may have on TCRs, and the type of environmental document being prepared. On February 14, 2022, the City formally initiated consultation with FIGR and invited the tribe to attend a virtual meeting to provide additional details and to discuss the proposed project. Subsequently, on February 16, 2022, the City received

an email from Hector Garcia Cabrales confirming receipt of the initiation letter and suggesting a date for a meeting.

The City and FIGR met on March 24, 2022. The attendees included Buffy McQuillen (FIGR), Hector Cabrales (FIGR), Gene Buvelot (FIGR-MLD), Maureen Geary (Tribal Counsel), Amy Skewes-Cox (CEQA Consultant), Irene Borba (City), Robert Zadnik (City), Brian S. Marks, Ph.D., RPA (ECORP), and Shannon Joy (ECORP). The City presented the project and discussed project alternatives being considered, mitigation measures for unanticipated discoveries of TCRs, and the type of CEQA document being prepared. The tribe did not provide any information about TCRs in the project area, but requested copies of technical documentation being prepared for the project to review. FIGR Cultural Resources Specialist Hector Garcia acknowledged receipt of this report on June 30, 2022. There have been no comments on the document to date. Consultation is still ongoing as of the time of preparation of this EIR and will be concluded prior to certification of the EIR and approval of the project by the City.

Additional Sources

In the absence of specific information about TCRs from consulting tribes, information about TCRs was drawn from additional sources, including records searches and literature reviews with the California Historical Resources Information System (CHRIS), a search of the Sacred Lands File by the NAHC, a review of existing ethnographic information, and a cultural resources survey (ECORP, 2022) that included an analysis of buried site potential. A summary of this information is as follows:

- A records search with the CHRIS revealed the presence of a previously recorded pre-contact archaeological site in the vicinity. The location of this resource is confidential and cannot be disclosed in a public document.
- The 2022 search of the NAHC's Sacred Lands File returned with positive results on March 27, 2022, indicating the presence of a documented sacred site on or near the project site. The location of this resource is confidential and cannot be disclosed in a public document.
- Ethnographically, the project area is in the northeastern portion of the territory occupied by the Penutian-speaking Coast Miwok and the project vicinity is an area known to have been used by ancestors to modern Native American communities.
- Because the majority of the project area is covered by impervious surfaces, the cultural resources survey did not yield any visible indicators of pre-contact Native American sites in the project footprint but concluded that the potential for encountering buried pre-contact resources is high because of the previously documented pre-contact resources within and adjacent to the project site (See *Section 4.4, Cultural Resources*, of this EIR).

The assessment of effects on TCRs was based on this information.

Significance Criteria

Following PRC Sections 21083.2 and 21084.1, and Section 15064.5 and Appendix G of the CEQA Guidelines, cultural resource impacts are considered to be significant if the project would:

1. Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5;

2. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5; or

3. Disturb any human remains, including those interred outside of dedicated cemeteries.

CEQA Guidelines Section 15064.5 defines substantial adverse change as physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource is materially impaired.

CEQA Guidelines Section 15064.5(b)(2) defines materially impaired for purposes of the definition of substantial adverse change as follows:

> The significance of an historical resource is materially impaired when a project:
>
> (A) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources; or
>
> (B) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
>
> (C) Demolishes or materially alters in an adverse manner those physical characteristics of a Historical Resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

CEQA requires that if a project would result in an effect that may cause a substantial adverse change in the significance of a historical resource or would cause significant effects on a unique archaeological resource, alternative plans or mitigation measures must be considered. Therefore, prior to assessing effects or developing mitigation measures, the significance of cultural resources must first be determined. The steps that are normally taken in a cultural resources investigation for CEQA compliance are as follows:

- Identify potential historical resources and unique archaeological resources;
- Evaluate the significance of the potential historical resources; and
- Evaluate the effects of the project on eligible (significant) historical resources and unique archaeological resources.

In accordance with Appendix G of the CEQA Guidelines, the project would have a significant impact on TCRs if it would:

1. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC 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:

a. Listed or eligible for listing in the CRHR, or in a local register of historical resources as defined in PRC Section 5020.1(k); or

b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe.

Less-than-Significant Impacts

The project would not have any less-than-significant impacts on TCRs as related to the significance criteria.

Potentially Significant Impacts

Impact TCR-1: The project could cause a substantial adverse change in the significance of a tribal cultural resource (TCR), defined in Public Resources Code (PRC) Section 21074. (PS)

No TCRs were identified within or immediately adjacent to the project site. Therefore, the proposed project would not result in a significant impact on known TCRs. However, ground-disturbing activities could result in the unanticipated discovery of TCRs and prehistoric archaeological sites that may be considered TCRs. As such, the impact on unknown TCRs is considered potentially significant.

Tribal monitoring during ground-disturbing activities, coupled with specific procedures for managing any unanticipated discoveries of TCRs, would ensure that any TCRs that may be unearthed during ground-disturbing activities are identified immediately and damage is minimized. Therefore, with implementation of Mitigation Measures TCR-1a, TCR-1b, and TCR-1c, the potential impact on unknown TCRs would be less than significant.

> *Mitigation Measure TCR-1a: One tribal monitor shall be retained to monitor all vegetation clearing and removal, surface grading, excavation, and trenching within the project site. The tribal monitor shall have the authority to temporarily pause ground disturbance within 100 feet of the discovery for a duration long enough to examine potential tribal cultural resources (TCRs) that may become unearthed during the activity. If no TCRs are identified, then construction activities may proceed, and no agency notifications are required. In the event that a TCR is identified, the monitor shall flag off the discovery location and notify the City of Belvedere immediately to implement Mitigation Measure TCR-1b. Work can continue in other areas of the project during implementation of Mitigation Measure TCR-1b, as long as it is monitored if required.*
>
> *Mitigation Measure TCR-1b: If any suspected tribal cultural resources (TCRs) are discovered during ground-disturbing construction activities, all work shall cease within 100 feet of the find, or an agreed-upon distance based on the project area and nature of the find. A Tribal Representative from a California Native American tribe that is traditionally and culturally affiliated with the geographic area shall be immediately notified and shall determine if the find is a TCR (see Public Resources Code [PRC] Section 21074). The Tribal Representative shall make recommendations for further evaluation and culturally*

appropriate treatment as necessary. If deemed necessary by the City of Belvedere, a qualified cultural resources specialist meeting the Secretary of Interior's Standards and Qualifications for Archeology may also assess the significance of the find in joint consultation with Native American Representatives to ensure that Tribal values are considered. Work at the discovery location may not resume until the City, in consultation as appropriate and in good faith, determines that all necessary investigation and treatment of the discovery under the requirements of the California Environmental Quality Act (CEQA), including Assembly Bill (AB) 52, have been satisfied.

Mitigation Measure TCR-1c: The City of Belvedere shall require the project contractor to provide a cultural resource and tribal cultural resource (TCR) sensitivity and awareness training program (Worker Environmental Awareness Program [WEAP]) for all personnel involved in project construction, including field consultants and construction workers. The WEAP shall be developed in coordination with an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for Archeology, as well as culturally affiliated Native American tribes. The City shall invite a Native American representative from interested culturally affiliated Native American tribes to participate. The WEAP shall be conducted before any project-related construction activities begin at the project site. The WEAP shall include relevant information regarding sensitive cultural resources and TCRs, including applicable regulations, protocols for avoidance, and consequences of violating state laws and regulations. The WEAP shall also describe appropriate avoidance and impact minimization measures for cultural resources and TCRs that could be located at the project site and shall outline what to do and whom to contact if any potential cultural resources or TCRs are encountered. The WEAP shall emphasize the requirement for confidentiality and culturally appropriate treatment of any discovery of significance to Native Americans and shall discuss appropriate behaviors and responsive actions, consistent with Native American tribal values.

The combination of Mitigation Measures TCR-1a, TCR-1b, and TCR-1c would reduce this impact to less than significant. (LTS)

Cumulative Impacts

The City of Belvedere and Marin County contain extensive cultural resources, including Native American archaeological sites, such as village sites, burial grounds, procurement sites, and lithic scatters. As development occurs over time, TCRs currently identified and those that may be identified in the future could be adversely affected. As discussed under Impact TCR-1, confidential tribal consultation resulted in agreement that there exists the possibility that unknown TCRs may be significantly affected by project construction. This impact would contribute to the cumulative impact on TCRs in Belvedere and elsewhere in Marin County. To address this impact, Mitigation Measures TCR-1a, TCR-1b, and TCR-1c were developed in consultation with FIGR. Implementation of the measure would reduce any potential impact on TCRs to less than significant. Given that any potential impact on TCRs due to the project would be minimized or avoided entirely through implementation of Mitigation Measures TCR-1a, TCR-1b, and TCR-1c, the contribution of the project to the cumulative impact on TCRs would be less than cumulatively considerable and no further mitigation is required.

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4.16 UTILITIES AND SERVICE SYSTEMS

INTRODUCTION

This section of the Draft Environmental Impact Report (EIR) describes the existing setting and the project's potential impacts on water, wastewater, solid waste disposal, and other utilities and services.

ENVIRONMENTAL SETTING

Utilities and Service Systems in Belvedere

The Marin Municipal Water District (MMWD or Marin Water) provides water service to the City of Belvedere. MMWD serves the eastern corridor of Marin County from the Golden Gate Bridge northward up to, but not including, Novato. The MMWD water supply consists primarily of runoff rainfall water collected in seven reservoirs, as well as imported water from the Russian River in Sonoma County (PMC, 2010).

Sanitary District No. 5 of Marin County (SD-5) provides collection and treatment of wastewater to the City of Belvedere and parts of the Tiburon Peninsula. SD-5 serves over 3,500 households. SD-5 owns and operates the Tiburon Wastewater Treatment Plant located at 2001 Paradise Drive in Tiburon (PMC, 2010).

Mill Valley Refuse Service collects residential and commercial garbage, recycling, and yard waste from the City of Belvedere, as well as from the cities of Corte Madera, Mill Valley, Tiburon, and surrounding unincorporated areas. Most solid waste in Marin County is transported to Redwood Landfill, a fully permitted Class III disposal site located approximately 3.5 miles north of Novato (PMC, 2010). Redwood Landfill has a current maximum permitted capacity of 19.1 million cubic yards (mcy). According to the State of California's database, as of December 2008, the landfill had a remaining capacity of 26 mcy, which is different from the permitted capacity. The landfill has a permitted throughput of 2,300 tons per day and currently is expected to cease operation in 2024 (CalRecycle, 2022).

Pacific Gas and Electric Company (PG&E) provides electricity and natural gas to Belvedere. Comcast and AT&T provide communication services (City of Belvedere, 2010).

Utilities and Service Systems at Project Site

As noted in *Chapter 3, Project Description*, of this EIR, the street rights-of-way (San Rafael Avenue and Beach Road) at the project site contain a network of underground utilities. These include MMWD water pipes, SD-5 sewer pipes, PG&E gas and electrical lines, and Comcast and AT&T communications lines. Water is used for irrigation of landscaped areas in these street rights-of-way. The Belvedere Lagoon Property Owners Association (BLPOA) also maintains facilities (two

large culverts and electrical controls for pumps) in the project site vicinity (see discussion of storm drainage facilities in *Section 4.9, Hydrology and Water Quality,* of this EIR.)

REGULATORY FRAMEWORK

Federal Regulations

No federal regulations related to utilities and service systems would apply to the project.

State Regulations

The California Integrated Waste Management Act of 1989 ("CIWMA") (Public Resources Code, Division 30, enacted through State Assembly Bill [AB] 939 and modified by subsequent legislation) was enacted to reduce, recycle, and reuse solid waste generated in the state to the maximum extent feasible. Specifically, the CIWMA required city and county jurisdictions to plan and implement programs to divert 50 percent of the total waste stream from landfill disposal by the year 2000 (Public Resources Code, Section 41780). The CIWMA also required each city and county to promote source reduction, recycling, and safe disposal or transformation. California cities and counties are required to submit annual reports to the state on their progress toward AB 939 goals.

Local Regulations and Policies

City of Belvedere General Plan

City of Belvedere General Plan goals, policies, and actions that would apply to the project and were adopted for the purpose of avoiding or mitigating an environmental impact related to utilities and service systems consist of the following (City of Belvedere, 2010):

Goal HAZ-1	Strive to protect the community from injury and damage resulting from natural catastrophes and other hazard conditions.
Policy HAZ-1.4	Ensure that the City is equipped for disaster, evacuation, and survival thereafter.
Action HAZ-1.4.2	Ensure that risk to public lifeline utilities, such as those along Beach Road and San Rafael Avenue, be reduced by installing excess flow valves, bracing, flexible joints and connections, joint restraint, strengthening of support structures, or other means.
Action HAZ-1.4.3	Ensure that lifeline utilities at risk of damage due to liquefaction be designed for easy access and repair, and consideration should be given to providing pre-designed replacement/repair fittings to allow rapid bridging of breaks at crucial locations where damage is anticipated.

Construction and Demolition Debris Diversion Requirements (Belvedere Municipal Code Chapter 16.30)

Belvedere Municipal Code Chapter 16.30 contains the City's requirements for diversion of construction and demolition debris from landfills. The regulations generally require that at least 50 percent of the total construction and demolition debris generated by a construction, demolition, and/or renovation project in the city be diverted via reuse or recycling. Applicants for building or demolition permits are required to submit a waste management plan for City approval and demonstrate compliance with the plan during construction and/or demolition (City of Belvedere, 2022).

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Significance Criteria

For the purposes of this Draft EIR and based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines, implementation of the proposed project would have a significant effect on utilities and service systems if it would:

1. 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;
2. Have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry or multiple dry years;
3. Result in a determination by the wastewater treatment provider that 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;
4. 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
5. Fail to comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

Less-than-Significant Impacts

Relocation or Construction of New or Expanded Facilities

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.

The project site contains water, sanitary sewer, electrical, gas, and other utility lines, as described under *Environmental Setting* above. The proposed sheet pile installation along Beach Road would occur in front of seven buildings located along the bay side of Beach Road. These seven buildings are served with sewer, water, gas, electricity, and communication utility lines. Prior to installation of the sheet piles, services to these buildings would be interrupted for up to 4 to 8 hours to establish temporary service connections. Following installation of the sheet piles, permanent utility service connections to the buildings would be re-established either through or around the new sheet piles. While the permanent service connections are re-established, there may be a second period of service interruptions up to 4 to 8 hours. Additionally, a gas line, a communication line, and a City

storm drain pipe located near and parallel to the sidewalk in front of the four bayside buildings next to the San Francisco Yacht Club (50 Beach Road, 58 Beach Road, 60-62 Beach Road, and 80-88 Beach Road) would have sheet piles installed in front of them. Sheet pile installations in front of those four buildings may require relocating a portion (up to a couple hundred feet) of the gas line, communication line, and City storm drain pipe that are near and parallel to the proposed sheet pile alignment (Fulwiler, 2022a).

The utility line relocations would take place within the project's overall area of disturbance, and therefore the environmental impacts of relocating these facilities are evaluated throughout this Draft EIR as part of the analysis of the project as a whole. The utility relocations would not have any specific adverse physical effects on the environment. The project would not lead to any increases in population or other changes that would create a need for new or expanded utilities. The impact would be less than significant, and no mitigation is necessary.

Project impacts on energy resources and stormwater drainage facilities are addressed in *Section 4.5, Energy*, and *Section 4.9, Hydrology and Water Quality*, of this EIR, respectively.

As noted in *Chapter 3, Project Description*, of this EIR, the City of Belvedere recommends that utility providers (e.g., MMWD, SD-5, PG&E) install flexible utility couplings to make their mainlines more resilient in the event of earthquakes, but these utility improvements are not part of the project because they are outside the control of the City of Belvedere. Any environmental impacts of such future improvements would be evaluated by the agency proposing the work, at the time the work is proposed.

Sufficiency of Water Supplies

The project would have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry or multiple dry years.

The project would not lead to any increases in population or other changes that would create new demand for water. Water demand may increase slightly during project construction (e.g., due to watering of exposed surfaces), but any increases would be temporary and would not create a need for new or expanded water allotments. Following the sheet pile installation, the City would replace any landscaping damaged during installation. The project would not expand the existing landscaped area and therefore would not increase demand for irrigation water. The impact would be less than significant, and no mitigation is necessary.

Wastewater Treatment Capacity

The project would not result in a determination by the wastewater treatment provider that serves the project site that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

The project would not lead to any increases in population or other changes that would create new demand for wastewater treatment. The impact would be less than significant, and no mitigation is necessary.

Solid Waste Capacity and Compliance with Standards

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. The project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

Project demolition and construction activities would generate waste, some of which would require disposal at a landfill. Once construction is completed, the project would not lead to any increases in population or other changes that would generate new solid waste affecting landfill capacity.

Project demolition activities would include removal of concrete sidewalks, road curbs, gutters, baserock, and portions of asphalt roadways. The amount of demolition material is estimated to be approximately 100 tons (50 tons for the San Rafael Avenue portion of the project and 50 tons for the Beach Road portion of the project) (Fulwiler, 2022b). For purposes of evaluating environmental impacts, it is assumed that 50 percent of this material (50 tons) would be reused or recycled in accordance with City of Belvedere waste diversion requirements, and the remaining 50 percent (50 tons) would be transported to the Redwood Landfill in Novato. The landfill's maximum permitted capacity (19.1 mcy) and permitted throughput (2,300 tons per day) far exceed the solid waste that would be generated by project construction (50 tons), and therefore it is reasonable to assume that adequate landfill capacity would be available for this amount of construction debris.

By law, the project must comply with all applicable federal, state, and local statutes and regulations related to solid waste. As a project sponsored by the City of Belvedere, the project would be subject to the construction waste reuse and recycling requirements of Belvedere Municipal Code Chapter 16.30, which are designed to achieve the waste diversion goals mandated by the California Integrated Waste Management Act.

For these reasons, the project would not be expected to generate solid waste in excess of applicable standards or infrastructure capacity, or otherwise impair attainment of solid waste reduction goals. The impact would be less than significant, and no mitigation is necessary.

Potentially Significant Impacts

The project would not have any potentially significant impacts related to utilities and service systems.

Cumulative Impacts

Water

For water service, the geographic scope for assessing cumulative impacts is the area within the MMWD service area. As discussed in the above project-specific analysis, the project would have no impact on water service or water demand. Therefore, the project would not contribute to cumulative impacts.

Wastewater

For wastewater service, the geographic scope for assessing cumulative impacts is the service area of SD-5. As discussed in the above project-specific analysis, the project would have no impact on wastewater service. Therefore, the project would not contribute to cumulative impacts.

Solid Waste Disposal

For solid waste disposal service, the geographic scope for assessing cumulative impacts consists of the service area of Redwood Landfill through 2024. The location for disposal of Belvedere's waste beyond 2024 has yet to be determined.

The project, in conjunction with past, present, and probable future projects, could result in a cumulative increase in solid waste and debris. The project would contribute to cumulative solid waste increases only over the short term, during project construction. Comprehensive implementation of state and local waste reduction and diversion requirements and programs has and would continue to reduce the potential for exceeding existing landfill capacity.

For these reasons, the project's effect on solid waste disposal service, in combination with other past, present, and probable future projects, would be less than significant. The project would not result in or contribute to any significant cumulative solid waste disposal service impacts.

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5. ALTERNATIVES

The California Environmental Quality Act (CEQA) Guidelines (Section 15126.6) require that an Environmental Impact Report (EIR) describe and evaluate the comparative merits of a range of reasonable alternatives to the project, or to the location of the project, that could feasibly attain most of the basic objectives of the project. The CEQA Guidelines further require that the discussion focus on potentially feasible alternatives capable of avoiding or substantially lessening any of the significant effects of the project, including the "No Project" Alternative. Furthermore, if the environmentally superior alternative is the "No Project" Alternative, the EIR must also identify an environmentally superior alternative from among the other alternatives (CEQA Guidelines Section 15126.6(e)).

There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the "rule of reason" (CEQA Guidelines Section 15126.6(a)). The "rule of reason" requires that an EIR set forth only those alternatives necessary to permit a reasoned choice and shall be limited to realistic alternatives that the lead agency determines could feasibly obtain most of the basic project objectives while avoiding or substantially lessening one or more of the significant effects (CEQA Guidelines Section 15126.6). The scope of alternatives comprising a reasonable range is in the lead agency's discretion and will vary from case to case depending on the nature of the project under review (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 566). Pursuant to CEQA Guidelines Section 15126.6(f)(3), "[a]n EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative."

The requirement that an EIR evaluate alternatives to the proposed project or its location is broad. The description or evaluation of alternatives does not need to be exhaustive, nor is the same level of detail as the proposed project required (CEQA Guidelines Section 15126.6(a) and (c)). Alternatives need be environmentally superior to the proposed project in only some respects (*Sierra Club v. City of Orange* (2008) 163 Cal.App.4th 523, 547).

As discussed in *Chapter 3, Project Description*, of this EIR, the project objectives are as follows:

- To reduce the risk of seismic impacts that could damage property, critical roads, utilities, and other infrastructure and put residents at risk.
- During construction, to minimize impacts on Belvedere residents while providing for the needed seismic upgrades.
- During construction, to minimize impacts on sensitive biological resources.
- During construction, to avoid direct impacts on fully tidal waters and wetlands to the maximum extent feasible.
- During construction, to minimize disruption to traffic flow, parking, and pedestrian access both during construction and at project completion.
- To design for long-term needs while making the project cost-effective for current residents.

The discussion in this chapter focuses on feasible alternatives that could address potentially significant impacts, primarily related to noise and vibration associated with the proposed sheet pile

construction. The EIR identifies potentially significant impacts that can be reduced to less-than-significant levels with implementation of mitigation measures (for air quality, biological resources, cultural resources, geology, noise, hazards, hydrology, transportation, and tribal cultural resources).

Two alternatives to the project are evaluated in this chapter:

- Alternative 1: No Project
- Alternative 2: Use of Silent Pile Drivers Alternative

These alternatives were identified as a reasonable range of alternatives for discussion in this EIR based on the following factors:

- The extent to which the alternative would accomplish most of the basic project objectives and purposes;
- The extent to which the alternative would reduce or eliminate one or more of the significant environmental effects of the project;
- The feasibility of the alternative, including whether the alternative could be accomplished in a successful manner within a reasonable period of time, taking into account site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and economic, environmental, legal, social, and technological factors (CEQA Guidelines Section 15364 and Section 15126.6(f); Public Resources Code Section 21061.1);
- The extent to which the alternative would contribute to a "reasonable range" of alternatives necessary to permit a reasoned choice; and
- The requirement under CEQA Guidelines Section 15126.6(e) to consider a No Project Alternative and to identify an "environmentally superior" alternative in addition to the No Project Alternative.

No other alternatives were considered but rejected, primarily because the project is so specific in scope and no other alternatives would meet the primary project objectives. The topics covered for each alternative are those also covered for the proposed project. For example, the topic of mineral resources is not covered because this topic was not relevant to the project.

5.1 SUMMARY OF ALTERNATIVES

ALTERNATIVE 1: NO PROJECT

Overview

The No Project Alternative would involve no new sheet piles placed along Beach Road or San Rafael Avenue. Existing conditions would remain unchanged and seismic instability risks would still exist, with the associated risk of damages to these major roads that could limit emergency vehicle access to Belvedere Island.

Impacts

Aesthetics

Under the No Project Alternative, no temporary, construction-related and less-than-significant visual impacts would occur. As with the proposed project, no long-term visual impacts would exist.

Air Quality

The No Project Alternative would have no impacts related to air quality as there would be no change from existing conditions. Unlike the project, the No Project Alternative would not generate any new air pollutant emissions during construction. As such, the No Project Alternative would result in fewer air quality impacts compared to the project.

Biological Resources

The No Project Alternative would not result in disturbance to regulated waters and essential habitat for listed special-status species that would occur under the project as part of sheet pile installation in the tidelands of Belvedere Cove. Potential construction-related impacts would also be avoided under this alternative.

Cultural Resources and Tribal Cultural Resources

The No Project Alternative would not result in any ground disturbance that could affect known or unknown cultural resources or tribal cultural resources. The No Project Alternative would result in no impact on cultural resources or tribal cultural resources.

Energy

As with the project, no change in long-term energy demand or services would occur under the No Project Alternative. This alternative would therefore have no impact on energy demand or facilities.

Geology/Soils

The No Project Alternative would have no impacts related to geology and soils as there would be no change from existing conditions. However, the No Project Alternative would not allow the opportunity for the implementation of seismic upgrades for roadways and utilities that are susceptible to damage from seismic activity.

Greenhouse Gas Emissions

The No Project Alternative would have no impacts related to greenhouse gas emissions as there would be no change from existing conditions. Unlike the project, the No Project Alternative would not generate any new greenhouse gases emissions during construction. Therefore, the No Project Alternative would result in fewer greenhouse gas emissions impacts compared to the proposed project.

Hazards and Hazardous Materials

The No Project Alternative would have no impacts related to hazards and hazardous materials as there would be no change from existing conditions. However, the No Project Alternative would not allow the opportunity for the implementation of seismic upgrades for roadways and utilities that are susceptible to damage from seismic activity and are critical for emergency response and evacuation purposes in case of a fire or other emergency.

Hydrology and Water Quality

Under the No Project Alternative, no temporary, construction-related hydrology and water quality impacts would occur. As with the project, no long-term hydrology and water quality impacts would exist.

Land Use and Planning

No impacts related to land use and planning would occur under the No Project Alternative, as there would be no change from existing conditions. As with the project, no land use impacts would occur.

Noise

The No Project Alternative would have no impacts related to noise and vibration as there would be no change from existing conditions. Unlike the project, the No Project Alternative would not generate any new noise or vibration impacts during construction. Therefore, the No Project Alternative would result in fewer noise and vibration impacts compared to the project.

Public Services

As with the project, no change in demands for fire protection, police, or other public services would occur under the No Project Alternative. This alternative would therefore have no impact on the need for new or physically altered fire stations, police facilities, or other public facilities.

Recreation

As with the project, no change in demand for recreational facilities would occur under the No Project Alternative. This alternative would therefore have no impact on existing parks or recreational facilities or the need for new facilities.

Transportation/Traffic

The No Project Alternative would have none of the construction traffic impacts associated with the project. However, the No Project Alternative would not allow the opportunity to strengthen the stability of San Rafael Avenue and Beach Road to protect these roads for access by emergency vehicles during a seismic event.

Utilities and Service Systems

As with the project, no change in water, wastewater, or solid waste demands or services would occur under the No Project Alternative. This alternative would therefore have no impact on utilities demand, capacity, or facilities.

Relationship to Project Objectives

The No Project Alternative would not meet any of the objectives of the proposed project. No seismic upgrades for Beach Road and San Rafael Avenue would occur and risks to the integrity of these roads for emergency vehicle access from seismic events would remain.

ALTERNATIVE 2: USE OF SILENT PILE DRIVERS ALTERNATIVE

Overview

This alternative would be similar in location and scope to the project. However, silent pile drivers would be used in place of vibratory pile drivers as a means of reducing noise and vibration associated with the project. With the project, vibratory pile drivers would be used for the majority of the project with some limited use of impact pile drivers. With Alternative 2, silent pile drivers would be used for the majority of the project with some limited use of both vibratory and impact pile drivers when necessary. The exact location of the use of each type of pile driver cannot be known until construction is underway, but the contractor would be informed about the more sensitive locations where use of a silent pile driver would be required. Under Alternative 2, the use of vibratory pile driving methods would be limited to the first few piles of a continuous sheet pile segment which would occur in areas that are as far away as possible from sensitive receptors for noise (e.g., residences) and structures, utilities, or other improvements that may be susceptible to damage from vibration and vibration-induced settlement where possible; however, the precise areas where vibratory pile driving methods would be used under Alternative 2 cannot be determined ahead of construction, as these would depend on the construction contractor's phasing of work, which could depend on various constraints such as the timing of site preparation and utility work. The limited use of impact pile driving equipment could also be required under Alternative 2 for the same reason as the project (i.e., if the target depth cannot be reached using other pile driving equipment); however, the use of impact pile driving equipment would only be performed in areas that are an adequate distance away from sensitive receptors and structures, utilities, or other improvements such that exposure to excessive noise or damage from vibrations and vibration-induced settlement would not occur. When necessary, pre-drilling or excavation of soil to depths of up to approximately 10 feet would be performed ahead of sheet pile installation to remove potential obstructions (e.g., large rocks) in the fill material of the levees in order to minimize the use of impact pile driving and ensure that vibratory or silent pile driving methods would reach the target depth.

Impacts

Aesthetics

This alternative would have the same visual/aesthetic impacts as the project, which would be no significant visual impacts.

Air Quality

Alternative 2 would result in similar air quality impacts during construction to the project. Therefore, Alternative 2 would result in less-than-significant impacts related to air quality, for the same reasons described in *Section 4.2, Air Quality,* for the project.

Biological Resources

The potential indirect effects of construction noise generated by the pile drivers under the project would be largely avoided under this alternative. However, other construction-generated noise from equipment operation and other activities could still disrupt nesting birds, and vibrations generated by the silent pile driver operation would still affect the aquatic habitat of Belvedere Cove under this alternative, similar to the project. Mitigation recommended for the project would still be warranted under this alternative to ensure adequate avoidance of possible impacts on nesting birds and special-status fish species, and impacts on regulated waters associated with Belvedere Cove.

Cultural Resources

This alternative has the potential to cause significant impacts on cultural resources, but by implementing the mitigation measures described in *Section 4.4, Cultural Resources*, these impacts would be reduced to less than significant.

Energy

As with the project, no change in long-term energy demand or services would occur under Alternative 2. This alternative would therefore have no impact on energy demand or facilities.

Geology/Soils

Alternative 2 would result in no impacts related to surface fault rupture and septic tanks or other alternative wastewater disposal systems for the same reasons described in *Section 4.6, Geology and Soils,* for the project. Alternative 2 would result in less-than-significant impacts related to ground shaking, soil erosion and loss of top soil, subsidence/collapse, expansive soils, and paleontological resources or unique geologic features for the same reasons described in *Section 4.6, Geology and Soils*, for the proposed project.

Alternative 2 would result in similar potentially significant impacts related to geology and soils as the project. Alternative 2 would involve installation of sheet piles in the same locations as the project, and would require mitigation measures similar to the project. Alternative 2 would not result in vibration-induced settlement of unstable soil while using silent pile driving equipment; however, the use of vibratory pile driving methods would still be required under Alternative 2 in order to install the first few sheet piles of a continuous segment of sheet piles. Under Alternative 2, the use of vibratory pile driving methods would be limited to areas that are as far away as possible from structures, utilities, or other improvements that may susceptible to damage from vibration-induced settlement where possible; however, the precise areas where vibratory pile driving methods would be used under Alternative 2 cannot be determined ahead of construction as these would depend on the construction contractor's phasing of work, which could depend on various constraints such as the timing of site preparation and utility work. The limited use of impact pile driving equipment

could also be required under Alternative 2 for the same reason as the project (i.e., if the target depth cannot be reached using other pile driving equipment). The use of vibratory and impact pile driving methods would be limited to areas that are an adequate distance away from structures, utilities, or other improvements such that damage from vibration-induced settlement would not occur. Because it is not known exactly where vibratory or impact pile driving equipment could be used, Alternative 2 could result in similar potentially significant impacts as the project and would require the same mitigation measures as the project related to geology and soils.

Greenhouse Gas Emissions

Alternative 2 would result in similar greenhouse gas emissions during construction as the project and would not result in new greenhouse gas emissions during operation. Therefore, Alternative 2 would result in less-than-significant impacts related to greenhouse gas emissions, for the same reasons described in *Section 4.7, Greenhouse Gas Emissions*.

Hazards and Hazardous Materials

Alternative 2 would result in no impacts related to aviation hazards for the same reasons described in *Section 4.8, Hazards and Hazardous Materials*. Also for the same reasons described in *Section 4.8, Hazards and Hazardous Materials*, Alternative 2 would result in less-than-significant impacts related to the routine transport, use, or disposal of hazardous materials; the accidental release of hazardous materials; hazardous emissions near schools; hazardous materials sites compiled pursuant to Government Code Section 65962.5; and wildfires.

Alternative 2 would also include the use of Belvedere Way (a designated evacuation route) for construction staging, and therefore would result in the same potentially significant impact related to emergency evacuation and response as the project, as described under Impact HAZ-1 in *Section 4.8, Hazards and Hazardous Materials.* Mitigation Measure HAZ-1 described in Section 4.8 *Hazards and Hazardous Materials*, would remain applicable to Alternative 2 and, as with the project, implementation of Mitigation Measure HAZ-1 would reduce this impact to less than significant.

Hydrology and Water Quality

This alternative would have hydrology and water quality impacts similar to those of the project.

Land Use and Planning

As with the project, Alternative 2 would have no land use impacts.

Noise

Alternative 2 would substantially reduce noise and vibration impacts from pile driving. However, vibratory pile driving methods would still be used under Alternative 2 in order to install the first few sheet piles of a continuous segment of sheet piles, and limited use of impact pile driving methods could still occur if necessary to reach the target depth for sheet piles. Under Alternative 2, the use of vibratory and impact pile driving methods would be limited to areas that are an adequate distance away from sensitive receptors and structures, utilities, or other improvements such that exposure to excessive noise or damage from vibrations would not occur. However, the precise

areas where vibratory or impact pile driving methods would be used under the Alternative 2 cannot be determined prior to construction as these would depend on the construction contractor's phasing of work, which could depend on various constraints such as the timing of site preparation and utility work. Because it is not known exactly where vibratory or impact pile driving equipment could be used, and because Alternative 2 could also include the use of other construction equipment that could generate noise and vibrations (e.g., excavators and compacters),Alternative 2 could result in similar potentially significant impacts as the project and would require the same mitigation measures as the project related to noise and vibration.

Public Services

As with the project, no change in demands for fire protection, police, or other public services would occur under Alternative 2. This alternative would therefore have no impact on the need for new or physically altered fire stations, police facilities, or other public facilities.

Recreation

As with the project, no change in demand for recreational facilities would occur under Alternative 2. This alternative would therefore have no impact on existing parks or recreational facilities or the need for new facilities.

Transportation/Traffic

Transportation impacts of Alternative 2 would be similar to those of the project and focused on construction vehicle impacts.

Utilities and Service Systems

As with the project, no change in water, wastewater, or solid waste demands or services would occur under Alternative 2. This alternative would therefore have no impact on utilities demand, capacity, or facilities.

Relationship to Project Objectives

Alternative 2 would meet all of the project objectives as listed at the beginning of this chapter except the following:

- To design for long-term needs while making the project cost-effective for current residents.

The use of silent pile drivers would be significantly higher in cost for the City of Belvedere, and residents could be affected by the increased price depending on the funding mechanism used to pay for the project.

5.2 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The No Project Alternative would be the "environmentally superior" alternative as no changes from existing conditions would occur. However, as stated earlier, CEQA Guidelines Section 15126.6(e) requires that an environmentally superior alternative in addition to the No Project Alternative be

identified. Alternative 2 would be the other environmentally superior alternative due to the reduced noise and vibration impacts of this alternative. Costs for the City of Belvedere would be higher with this alternative, but this does not preclude this alternative from being identified as environmentally superior.

A comparison of the alternatives is provided in Table 5-1 below.

TABLE 5-1 COMPARISON OF IMPACTS OF PROJECT ALTERNATIVES (AFTER MITIGATION)

Environmental Issue Area	Proposed Project	ALTERNATIVE 1 No Project	ALTERNATIVE 2 Use of Silent Pile Drivers Alternative
Aesthetics	LTS	LTS- (NI)	LTS
Air Quality	LTS	LTS- (NI)	LTS
Biological Resources	LTS	LTS- (NI)	LTS-
Cultural Resources	LTS	LTS- (NI)	LTS
Energy	LTS	LTS- (NI)	LTS
Geology/Soils	LTS	LTS	LTS
Greenhouse Gas Emissions	LTS	LTS- (NI)	LTS
Hazards and Hazardous Materials	LTS	LTS	LTS
Hydrology and Water Quality	LTS	LTS- (NI)	LTS
Land Use and Planning	LTS	LTS- (NI)	LTS
Noise	LTS	LTS- (NI)	LTS-
Public Services	LTS	LTS- (NI)	LTS
Recreation	LTS	LTS- (NI)	LTS
Transportation/Traffic	LTS	LTS- (NI)	LTS
Tribal Cultural Resources	LTS	LTS- (NI)	LTS
Utilities and Service Systems	LTS	LTS- (NI)	LTS

Notes: LTS = Less than Significant
SU = Significant and Unavoidable
+ = Greater adverse impact than proposed project
- = Lesser adverse impact than proposed project
(NI) = alternative would have no impact

5.3 REFERENCES

California Public Resources Code, Section 21061.1.

6. OTHER CEQA CONSIDERATIONS

As required by the California Environmental Quality Act (CEQA), this chapter of the Draft Environmental Impact Report (EIR) identifies significant irreversible effects, significant unavoidable impacts, growth inducement, and cumulative impacts that may result from the Belvedere Seismic Upgrade Project (BUSP or project).

6.1 SIGNIFICANT IRREVERSIBLE EFFECTS

Under CEQA, impacts associated with a proposed project may be considered to be significant and irreversible for the following reasons:

- Uses of non-renewable resources during the initial and continued phases of the project may be irreversible, since a large commitment of such resources makes the removal or non-use thereafter unlikely;
- Primary impacts and, particularly, secondary impacts (such as a highway improvement that provides access to a previously inaccessible area) generally commit future generations to similar uses; and
- Irreversible damage can result from environmental accidents associated with the project.

Pursuant to the CEQA Guidelines, irretrievable commitments of resources should also be evaluated to ensure that such current consumption is justified (CEQA Guidelines Section 15126.2(d)).

The project's proposed sheet piles would be permanent; therefore, their installation would constitute an irreversible use of resources, as it is unlikely that sheet piles would be removed. The project would irretrievably commit materials to the construction of new sheet piles. Non-renewable resources such as sand, gravel, and steel, and some renewable resources such as lumber, would be consumed during project construction. In addition, the construction of the project would result in the use of energy, including electricity and fossil fuels. The consumption of such resources associated with construction would end upon completion of the project. Resources would not be consumed for operation.

The project is not expected to result in any activities likely to result in accidents that could lead to irreversible environmental damage. While construction of the project could result in the use, transport, storage, and disposal of hazardous materials as described in *Section 4.8, Hazards and Hazardous Materials,* of this EIR, all activities would comply with applicable laws related to hazardous materials, which would significantly reduce the likelihood and severity of accidents that could result in irreversible environmental damage.

6.2 SIGNIFICANT UNAVOIDABLE IMPACTS

All potential impacts identified for the proposed project could be mitigated to a less-than-significant level.

6.3 GROWTH INDUCEMENT

The CEQA Guidelines require that an EIR evaluate the growth-inducing impacts of a proposed action (CEQA Guidelines Section 15126.2(e)). A growth-inducing impact is defined as:

> [T]he 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… It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

A project can have direct and/or indirect growth inducement potential. Direct growth inducement would result if a project actually induced or required that additional actions or projects be implemented. An example would be a new housing development that requires the construction of new utility lines and roads to serve the development. Indirect growth inducement would occur if the project would remove an obstacle to additional growth and development. An example would be a major expansion of a public service facility that increases service capability in the area.

The project would be developed on an existing disturbed roadway area of Belvedere edged by San Francisco Bay and primarily residential development. Services are readily available in this area. The project would not require wastewater or water lines that would cross undeveloped lands and create the potential for new development. No major road improvements would be required. Disturbance to any pedestrian paths and road paving would be corrected upon completion of sheet pile installation.

The project would not induce further residential or commercial development, as the area is built out and the project is intended solely for increasing seismic stability of roads that provide emergency access to developed areas of Belvedere.

6.4 CUMULATIVE IMPACTS

Cumulative impacts have been addressed in *Chapter 4, Environmental Setting, Impacts, and Mitigation Measures,* for each topic covered in this Draft EIR. Unless otherwise noted in the topic area sections in Chapter 4, the cumulative impact analysis considers the following two projects that are currently pending in the City of Belvedere: (1) the Mallard Pointe Project, a proposed 42-unit residential project at 1-22 Mallard Road for which a preliminary application has been filed; and (2) the Flood Barrier Project which is still in the planning stages and would entail a future seawall project in the same area as the BSUP. Figure 6-1 shows the locations of these two projects, which are described in more detail below.

Figure 6-1

SOURCE: Stetson Engineers, 2022 and Skewes-Cox, 2022

CUMULATIVE PROJECTS

MALLARD POINTE PROJECT

In June 2021, a preliminary application was filed for a new residential development to be located at 1-22 Mallard Road, about 1,000 feet north of the Beach Road portion of the BSUP. Currently, the site of the Mallard Pointe Project is occupied by 22 residential units (duplexes). These are proposed to be demolished and 42 new residential units would be constructed in their place. These new units would include 16 single-family and duplex units, three Accessory Dwelling Units (ADUs), and 23 apartments. The ADUs would be one-bedroom units located above three of the single-family home attached garages. On-site parking for 102 cars would be provided, with 29 garage spaces in single-family homes and duplexes, 46 garage spaces in the apartment parking structure, and 27 unassigned or apron parking spaces. A total of 114 bicycle parking stalls would be provided. Buildings would range in height from one to three stories.

The new buildings would line Mallard Road (shown as "Private Drive" in Figure 6-2) at both ends, between its two intersections with Community Road. Community Road connects to San Rafael Avenue about 1,000 feet north of Beach Road, and also connects to San Rafael Avenue farther north, via Leeward Road. Buildings 1 through 11 would front onto the Belvedere Lagoon. The 23 apartments would be located in an "island" area bounded by Mallard Road and Community Road as shown in the site plan (see Figure 6-2).

A formal document under the requirements of CEQA was not completed for the Mallard Pointe project because it was determined that the project was exempt under CEQA Guidelines Section 15332.

FLOOD BARRIER PROJECT

The City of Belvedere's Flood Barrier Project would strengthen and raise the San Rafael Avenue and Beach Road levees/embankments and create a new coastal flood barrier along the San Francisco Bay frontage of certain nearby properties. Final designs have not been completed because part of the Flood Barrier Project would require the use of private properties and full approval of such use has not been granted. Lands in the ownership of the Belvedere Land Company and private residences along West Shore Road would be needed for the Flood Barrier Project and final design has not been completed.

The Flood Barrier Project work would be independent from the BSUP evaluated in this EIR. While the seismic strengthening of the BSUP would also benefit the Flood Barrier Project, it would not require the Flood Barrier Project to be constructed. The Flood Barrier Project would provide other benefits not provided by the BSUP as discussed below.

The improvements tentatively included in the Flood Barrier Project and described below would achieve the following objectives:

- Flood Protection. Barriers would substantially reduce coastal overtopping, thereby providing substantial protection to interior areas from flooding and roadways and utility corridors from damage due to erosion.
- Additional Benefits. Public walkways would be improved, a new linear park element would be created on Beach Road, and landscaping along both levees would be enhanced.

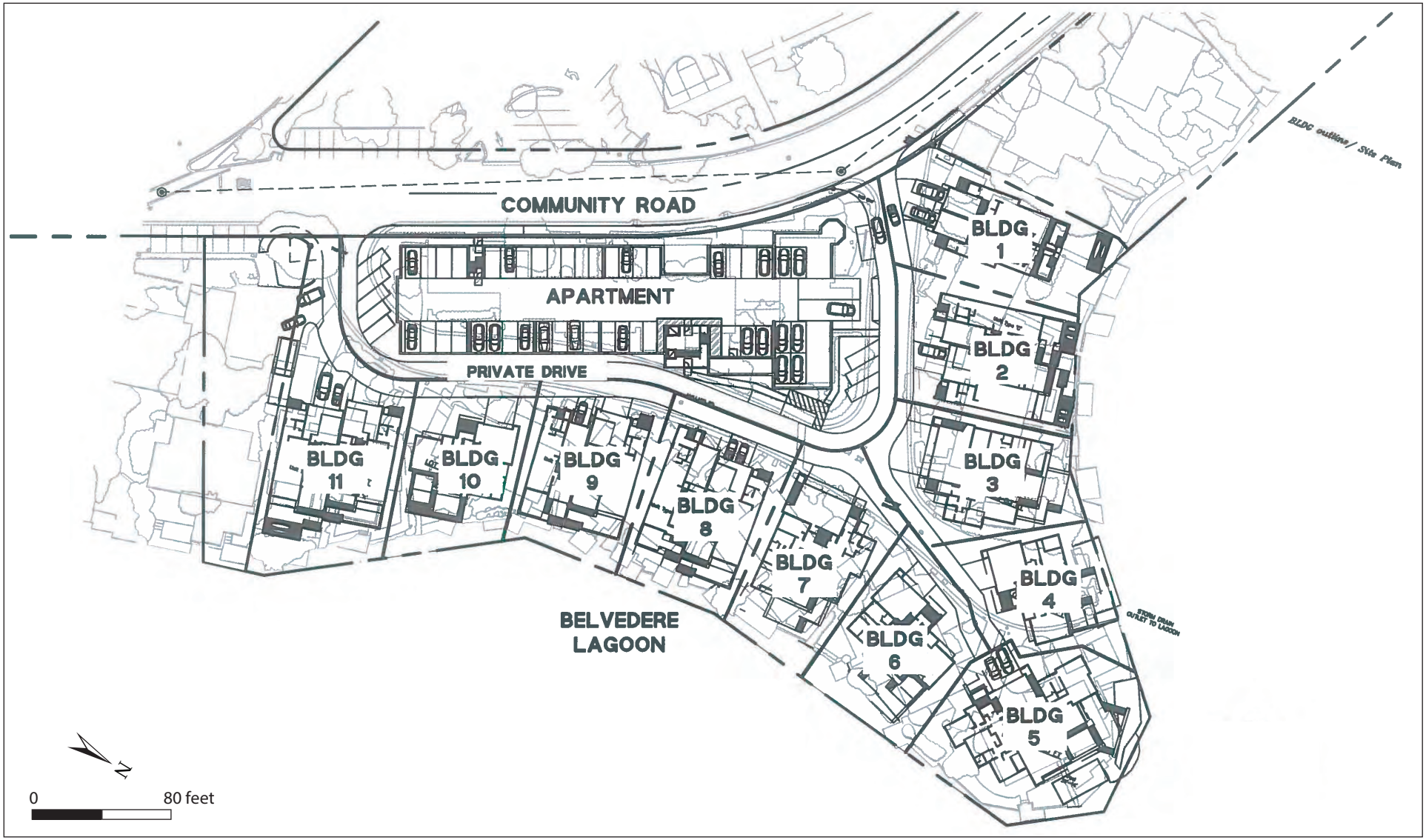

Figure 6-2

SOURCE: BKF, 2021

MALLARD POINTE PROJECT SITE PLAN

AMY SKEWES~COX
ENVIRONMENTAL PLANNING

- Resiliency and Ready Adaptability. Barriers would be readily modifiable to function effectively under future sea level rise conditions. At this time, it is expected that barrier heights would not be any higher than needed to protect against Year 2050 estimated sea levels. However, foundations would be constructed to allow future modifications that would provide substantial protection from estimated Year 2100 sea levels.

San Rafael Avenue Levee/Road Embankment Improvements

These improvements would involve construction of a wall or similar barrier feature along the bayside top of the San Rafael Avenue levee/embankment to an elevation of 12.4 feet North American Vertical Datum (NAVD), a new 5-foot minimum width walking path, and new landscaped park features. The elevation of the existing walking path ranges from about 8 feet to 10 feet NAVD, so the height of the barrier would be an estimated 2.4 feet to 4.4 feet above the path. The barrier would be about 1 foot wide. The City proposes that landscaping be placed on the inland side of this wall for visual screening. South of Windward Road, the barrier would be located on the street side of the walking path. North of Windward Road, the seawall would be placed on the Bay side of the walking path, and the existing access points along San Rafael Avenue would be unchanged.

Around the center portion of the project on San Rafael Avenue, opposite Windward Road, the walking path would be raised to allow pedestrians to cross over the landscaped seawall.

Beach Road Levee/Road Embankment Improvements

The Beach Road improvements would result in a seawall elevated to 12.3 feet NAVD, much of which would be hidden within a new park feature. To provide space for the park/seawall feature on the Bay side of the street while maintaining adequate road width, the existing median would be removed. To enhance pedestrian access, a new sidewalk would be built along the eastern edge of the existing roundabout at the San Rafael Avenue intersection. For the southwestern and northeastern segments, the floodwall would be placed along the edge of the existing sidewalk. A new landscaped park feature would be added in the area between Peninsula Road and Cove Road. The barrier would be somewhat lower near the San Francisco Yacht Club; access would be facilitated by bringing walkways up and over the barrier.

West Shore Road Coastal Flood Barrier

The Flood Barrier Project component for West Shore Road would involve placement of a new low barrier feature within the backyards of the six private properties located at 1, 3, 5, 7, 9, and 11 West Shore Road that adjoin San Francisco Bay. The northern end of this feature would tie into the San Rafael Avenue barrier. The southern end would tie into the existing grade along West Shore Road at an elevation of 10.8 feet. The top of the barrier would be at elevation 10.8 feet NAVD and the height would be approximately less than 1 foot to 2 feet above grade or less. The barrier could be integrated into landscape features on those properties, such as retaining walls or other hardscape features, to minimize impacts on those properties. More detailed surveying and consultations with the property owners would be needed as part of feasibility design to minimize impacts and develop design details that conform to the properties.

Future Environmental Analysis

It is assumed that future environmental review would be required for the Flood Barrier Project. Because the final designs have not be developed, this Draft EIR addresses the Flood Barrier Project at a very generalized level as appropriate in the cumulative analysis discussed in each topic area section of *Chapter 4, Environmental Setting, Impacts, and Mitigation Measures*.

7. EIR AUTHORS

The Draft EIR was prepared by the following CEQA consultants under the direction of the City of Belvedere.

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David Parisi, Parisi Transportation Consulting: *Transportation*

James Reilly and Julian Fulwiler, Stetson Engineers, *Hydrology and Project Description*

Natalie Macris: *Project Management Assistance and Editing; Services, Utilities, Recreation, and Energy*

Brian Marks ad Lisa Westwood, Ecorps Consulting: *Cultural Resources*

Tom Camara and Cindy Chan: *Graphics*

Susan Smith, Wordsmith: *Word Processing*

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None

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None

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ALTERNATIVES

California Public Resources Code, Section 21061.1.

CEQA CONSIDERATIONS

None.

APPENDIX A
NOTICE OF PREPARATION AND COMMENT LETTERS FOR NOTICE OF PREPARATION

CITY of BELVEDERE

450 San Rafael Avenue • Belvedere CA 94920-2336
Tel.: 415.435.3838 • Fax: 415.435.0430
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NOTICE OF PREPARATION (NOP)

To: State Clearinghouse (via email)
Affected Agencies (via Certified Mail)
Interested Organizations and Persons and Neighbors (via email and posted on City's website)

Date: January 11, 2022

From: City of Belvedere

Subject: Notice of Preparation of a Draft Environmental Impact Report for the Belvedere Critical Infrastructure Project and Scoping Meeting to be Held February 9, 2022

Lead Agency: City of Belvedere
Public Works Department
450 San Rafael Avenue
Belvedere, CA 94920

Contact: Mr. Robert Zadnik
Public Works Director
rzadnik@cityofbelvedere.org
(415) 435-4111

Notice is hereby given that the City of Belvedere will be the Lead Agency and will prepare an Environmental Impact Report (EIR) for the critical infrastructure project described below. The California Environmental Quality Act (CEQA) requires that the City conduct environmental review of the project, which has the potential to result in physical change to the environment. The City, the public agency with the principal responsibility for approving and carrying out the project, has determined that an EIR will be the required CEQA document for the project.

The City of Belvedere is issuing this Notice of Preparation (NOP) to invite comments on the scope and content of the study for the EIR. This NOP is being sent to local agencies, nearby residents, and other interested parties. When the Draft EIR is published, a Notice of Availability (NOA) will be sent to all parties who respond to this NOP or who otherwise indicate that they would like to receive a copy of the Draft EIR. The EIR will be available on the City's website.

Responding to this NOP

Responses to this NOP and any related questions or comments regarding the scope or content of the Draft EIR must be directed in writing to: Ms. Amy Skewes-Cox, Environmental Planner, PO Box 422, Ross, CA 94957. The best way to submit comments is via email to amysc@rtasc.com with a copy to Mr. Robert Zadnik, Public Works Director at rzadnik@cityofbelvedere.org.

Comments on the NOP must be received at the above mailing or email address within 30 days of this notice, or before **February 9, 2022, at 5:30 PM**. Please reference the project title of "Belvedere Critical Infrastructure Project" in all correspondence.

Scoping Meeting

Further notice is hereby given that pursuant to Section 15082 of the CEQA Guidelines, a Public Scoping Session will be held to accept comments from Responsible and Affected Agencies, and the public about the scope of the EIR on **February 9, 2022 at 5:30**PM via Zoom. This meeting can be accessed using Zoom at the following link: https://us02web.zoom.us/j/87375769995?pwd=TWtHcmY5TUR6NjVXR3JPR1QweEtEZz09. The project will be briefly described and then the meeting will be opened to comments.

Responses to this NOP and comments at the scoping meeting should focus, specific to this project, on the potentially significant environmental effects that the project may have on the physical environment, ways in which those effects might be minimized, and potential alternatives to the project that should be addressed in the EIR. This focus aligns with the purpose of the EIR to inform the public about these aspects of the project.

Existing Conditions

Belvedere currently has a system of levees/road embankments that provide ingress/egress to much of the city, contain key utility trunk lines, and protect the city from flooding associated with the nearby San Francisco Bay during storm events.

These levees/road embankments were built on top of weak, compressible, and liquefiable soils. As such, they are vulnerable to displacement, deformation, and damage from strong seismic ground shaking. Portions of the Beach Road levee/embankment have been undermined by coastal waves, requiring recent construction of short-term protective measures to arrest further movement and deformation of the seawall. Further, these levees/road embankments have historically settled, and settlement is expected to continue.

The levees/road embankments function as critical transportation and utilities corridors serving Belvedere Island. Keeping their proper functioning condition intact, especially for maintaining water/fire flow service and providing evacuation routes, is essential to providing vital public services during earthquake disasters, coastal floods and other emergencies.

Further, the projected rise in sea level will render the levees/road embankments less effective as a barrier to significant flooding caused by stillwater and wave runup.

The objective of the "Critical Infrastructure Project" is to safeguard life and property by providing substantial and achievable protection against hazards associated with seismic damage to levees/road embankments and by significantly reducing the likelihood of largescale flooding.

Project Description

The Belvedere Critical Infrastructure Project would strengthen and raise the San Rafael Avenue and Beach Road levees/embankments and create a new coastal flood barrier along the San Francisco Bay frontage of certain West Shore properties (see **Figures 1** and **3**). These improvements would achieve the following objectives:

- Levee Strengthening. Sheet piling along Beach Road and portions of San Rafael Avenue would strengthen the levees and provide stability and substantial protection against deformation during a strong earthquake.
- Flood Protection. Barriers would substantially reduce coastal overtopping, thereby providing substantial protection to interior areas from flooding as well as roadways/utility corridors serving the community from damage due to erosion.
- Additional Benefits. Public walkways would be improved; a new linear park element would be created on Beach Road, and landscaping along both levees would be enhanced.
- Resiliency and Ready Adaptability. Barriers would be readily modifiable to function effectively under future sea level rise conditions. At this time, barrier heights would not be any higher than needed to protect against Year 2050 estimated sea levels. However, foundations would be constructed to allow future modifications that would provide substantial protection from estimated Year 2100 sea levels.

San Rafael Avenue Levee/Road Embankment Improvements

These improvements would involve construction of a wall or similar barrier feature along the bayside top of the San Rafael Avenue levee/embankment to elevation 12.4 feet North American Vertical Datum (NAVD), a new 5-foot minimum width walking path, and new landscaped park features (see **Figure 1**). The elevation of the existing walking path ranges from about 8 feet to 10 feet NAVD, so the height of the barrier would range from about 2.4 feet to 4.4 feet above the existing path. A typical cross section is provided in **Figure 2**. The barrier would be about 1-foot wide. The City proposes that landscaping be placed on the inland side of this wall for visual screening (see **Figure 2**). New sheet piling to stabilize the levee would be installed underground along portions of San Rafael Avenue and would not be visible. South of Windward Road, the barrier would be located on the street side of the walking path. This is also the segment of the levee that is most susceptible to damage from seismic ground shaking. Along this segment, sheet piling would be integrated with the wall foundation. North of Windward Road, the seawall would be placed on the Bay side of the walking path, and the existing access points along San Rafael Avenue would be unchanged. Around the center portion of the project on San Rafael Avenue, opposite Windward Road, the walking path would rise to allow pedestrians to cross over the landscaped seawall. Existing parks at both ends of San Rafael Avenue would be improved with new landscaping. Existing drainage outfalls would be retained.

Beach Road Levee/Road Embankment Improvements

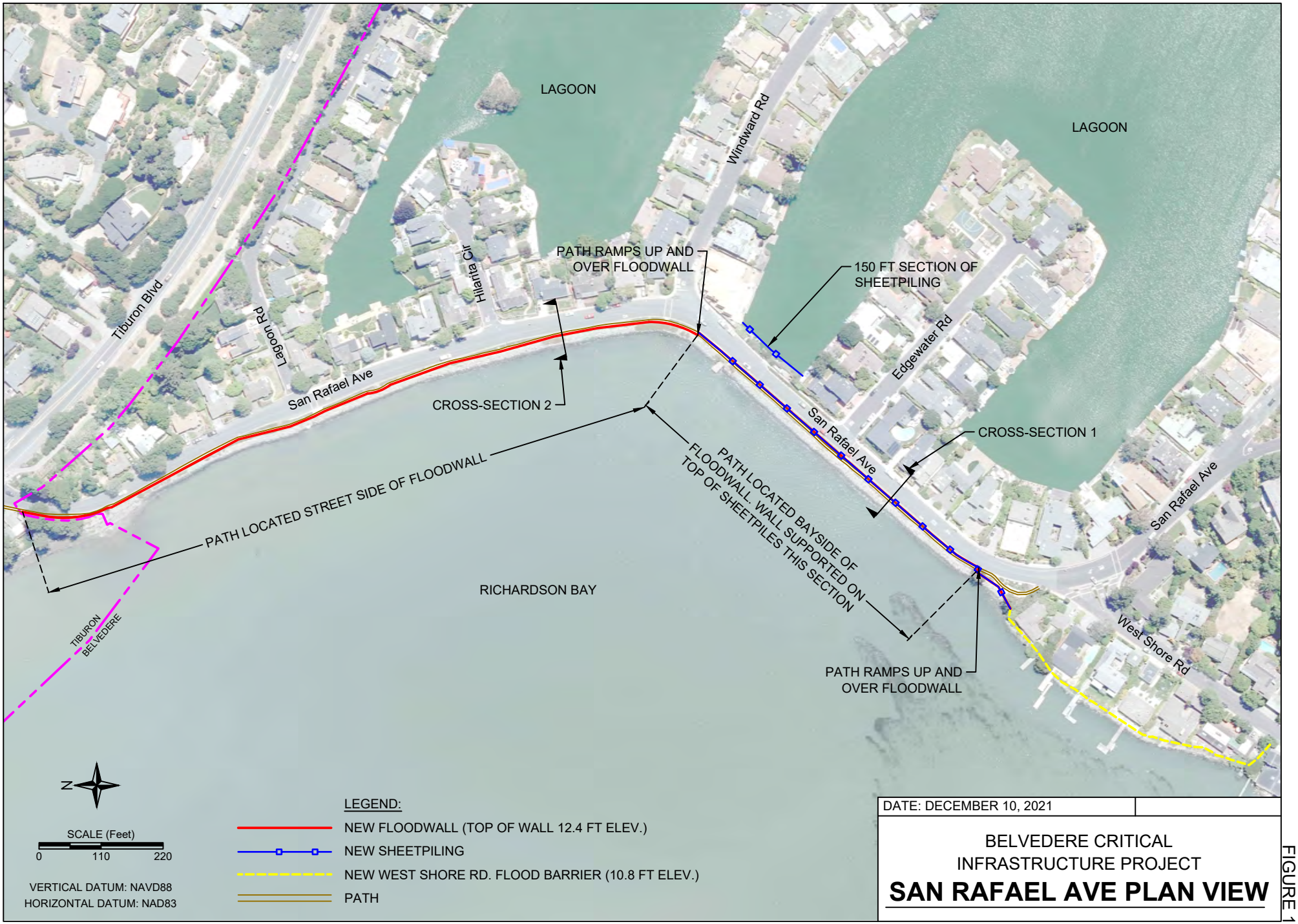
The Beach Road improvements would result in a seawall elevated up to 12.3 feet NAVD, much of which would be hidden within a new park feature. To provide space for the park/seawall feature on the bay side of the street while maintaining adequate road width, the existing median would be removed (see **Figure 3**). To enhance pedestrian access, a new sidewalk would be built along the eastern edge of the existing roundabout at the San Rafael Avenue intersection (see **Figure 4)**. For the southwestern and northeastern segments, the floodwall would be placed along the edge of the existing sidewalk. A new landscaped park feature would be added in the area opposite Peninsula and Cove Roads (see **Figure 3**). The barrier would be somewhat lower near the San Francisco Yacht Club; access would be facilitated by bringing walkways up and over the barrier. Underground sheet-piling would be incorporated along the entire reach of Beach Road for strengthening and seismic stability (see **Figures 3** and **4**). To protect against erosion from overland flow of residual coastal overtopping floodwaters through nearby properties, stormwater features would be constructed to direct these floodwaters into the lagoon.

West Shore Road Coastal Flood Barrier

The project component for West Shore Road involves placement of a new low barrier feature within the back yards of the six private properties located at 1, 3, 5, 7, 9, and 11 West Shore Road that are adjacent to San Francisco Bay (see **Figure 1**). The northern end of this feature would join the San Rafael Avenue barrier. The southern end would tie into the existing grade along West Shore at elevation 10.8 feet. The top of the barrier would be at elevation 10.8 feet NAVD and the height would range from less than 1 foot to 2 feet above grade. The barrier could be integrated into landscape features on those properties, such as retaining walls or other hardscape features, to minimize impacts to those properties. More detailed surveying and consultations with the property owners will be performed as part of feasibility design to minimize impacts and develop design details that conform to the properties. Cross sections have not yet been prepared for this segment of the improvements.

Potential Environmental Effects

The EIR will address the following potential environmental effects: Aesthetics, Air Quality, Biological Resources, Cultural Resources, Energy, Tribal Cultural Resources, Energy, Geology/Soils, Hazards, Noise, Public Services, Recreation, Greenhouse Gas Emissions, Hydrology and Water Quality, Land Use, Transportation/Traffic, Utilities, and Wildfire. The EIR will examine project and cumulative effects and a reasonable range of alternatives to the project that may be capable of reducing or avoiding potential environmental effects that may be identified for the project. The topics of Agricultural and Forestry Resources, Mineral Resources, and Population/Housing will not be addressed in the EIR as these do not apply to the project or project site. The level of analysis for the subject areas to be analyzed may be refined based on responses to this NOP and/or refinements to the project that may occur after publication of this NOP.



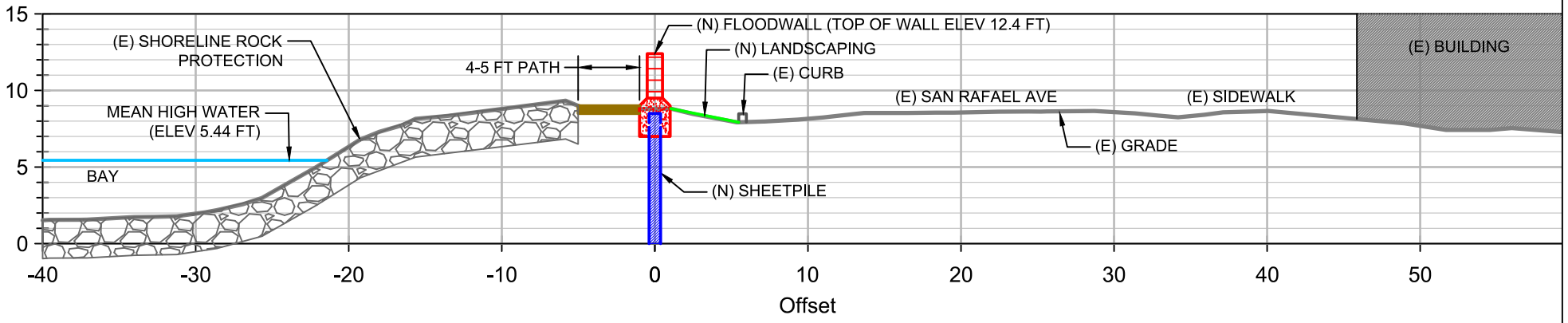
DATE: DECEMBER 10, 2021

BELVEDERE CRITICAL INFRASTRUCTURE PROJECT

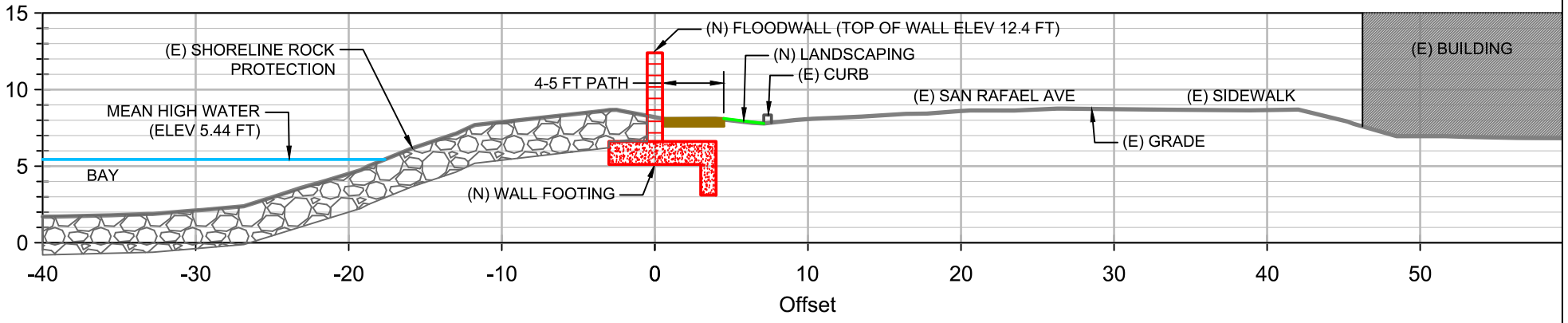
SAN RAFAEL AVE PLAN VIEW

FIGURE 1

CROSS-SECTION 1



CROSS-SECTION 2



(E) EXISTING
(N) NEW

SCALE (Feet)
0 5 10

VERTICAL DATUM: NAVD88
HORIZONTAL DATUM: NAD83

DATE: DECEMBER 10, 2021

BELVEDERE CRITICAL INFRASTRUCTURE PROJECT

SAN RAFAEL AVE TYPICAL CROSS-SECTIONS

FIGURE 2

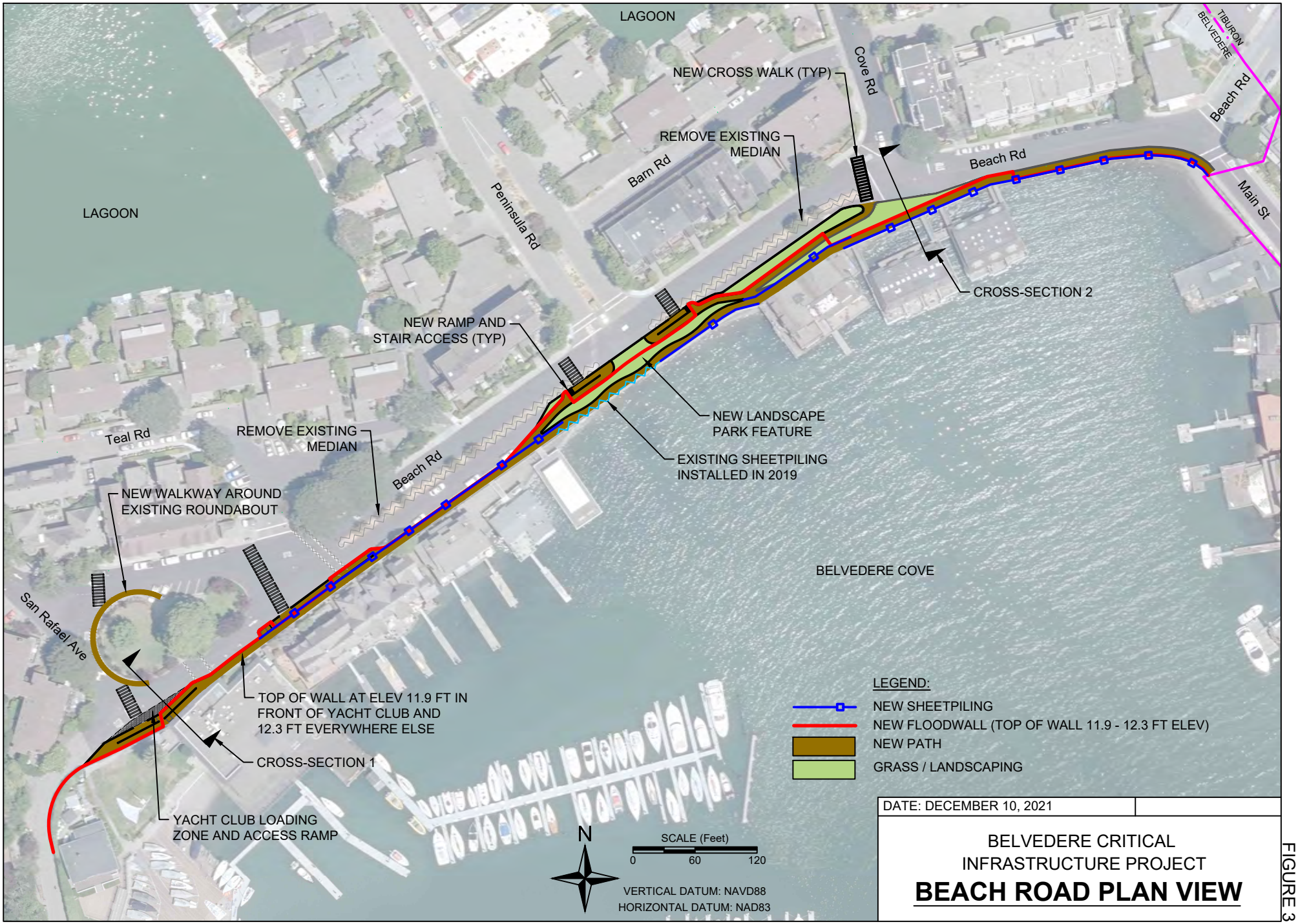
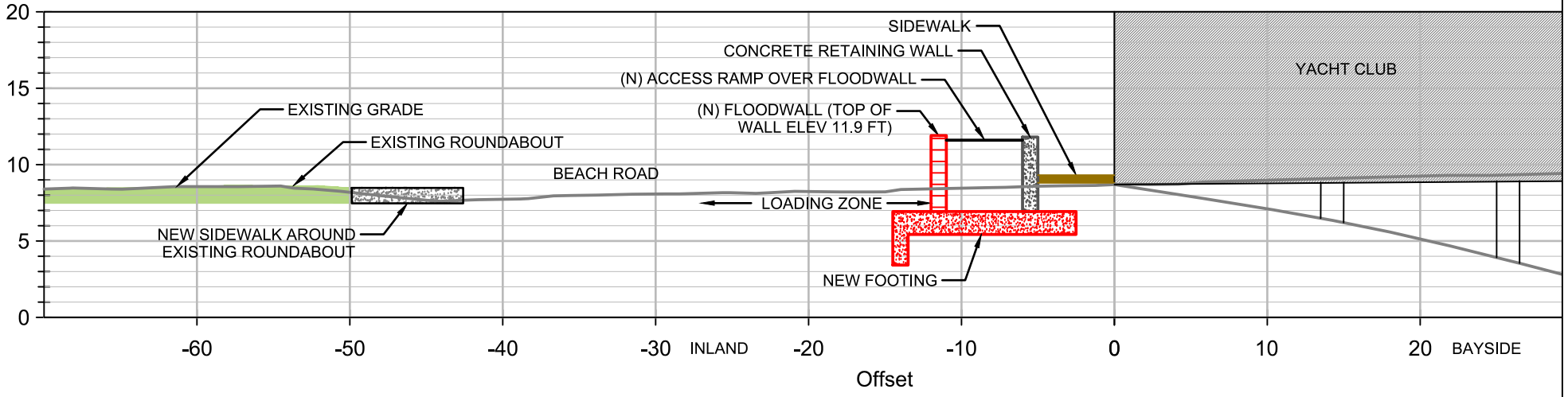
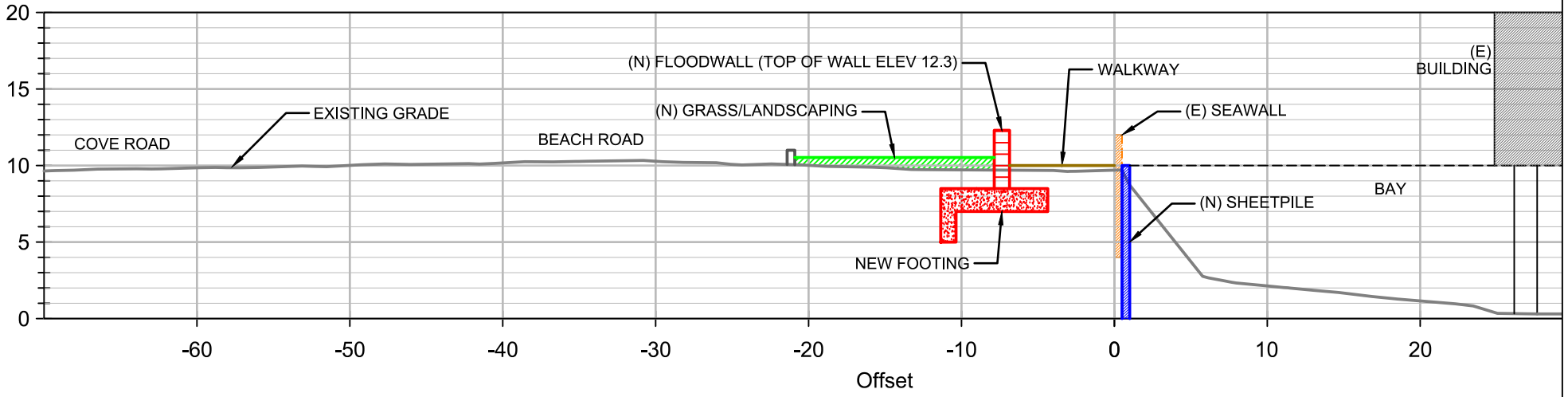

LAGOON
LAGOON
NEW CROSS WALK (TYP)
Cove Rd
REMOVE EXISTING MEDIAN
Barn Rd
Peninsula Rd
Beach Rd
Beach Rd
TIBURON BELVEDERE
Main St
CROSS-SECTION 2
NEW RAMP AND STAIR ACCESS (TYP)
NEW LANDSCAPE PARK FEATURE
EXISTING SHEETPILING INSTALLED IN 2019
Teal Rd
REMOVE EXISTING MEDIAN
Beach Rd
NEW WALKWAY AROUND EXISTING ROUNDABOUT
BELVEDERE COVE
San Rafael Ave
TOP OF WALL AT ELEV 11.9 FT IN FRONT OF YACHT CLUB AND 12.3 FT EVERYWHERE ELSE
CROSS-SECTION 1
YACHT CLUB LOADING ZONE AND ACCESS RAMP
LEGEND:
NEW SHEETPILING
NEW FLOODWALL (TOP OF WALL 11.9 - 12.3 FT ELEV)
NEW PATH
GRASS / LANDSCAPING
N
SCALE (Feet)
0
60
120
VERTICAL DATUM: NAVD88
HORIZONTAL DATUM: NAD83
DATE: DECEMBER 10, 2021
BELVEDERE CRITICAL INFRASTRUCTURE PROJECT
BEACH ROAD PLAN VIEW

FIGURE 3

CROSS-SECTION 1



CROSS-SECTION 2



(E) EXISTING
(N) NEW

SCALE (Feet)
0 5 10

VERTICAL DATUM: NAVD88
HORIZONTAL DATUM: NAD83

DATE: DECEMBER 10, 2021

BELVEDERE CRITICAL INFRASTRUCTURE PROJECT

BEACH ROAD TYPICAL CROSS-SECTIONS

FIGURE 4

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Bay Delta Region
2825 Cordelia Road, Suite 100
Fairfield, CA 94534
(707) 428-2002
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

February 3, 2022

Mr. Robert Zadnik
City of Belvedere
450 San Rafael Avenue
Belvedere, CA 94920
rzadnik@cityofbelvedere.org

Subject: Belvedere Critical Infrastructure Project, Notice of Preparation of a Draft Environmental Impact Report, SCH No. 2022010159, City of Belvedere, Marin County

Dear Mr. Zadnik:

The California Department of Fish and Wildlife (CDFW) has reviewed the Notice of Preparation (NOP) of a draft Environmental Impact Report (EIR) from the City of Belvedere (City) for the Belvedere Critical Infrastructure Project (Project).

CDFW is a **Trustee Agency** with responsibility under the California Environmental Quality Act (CEQA) for commenting on projects that could impact fish, plant, and wildlife resources (Pub. Resources Code, § 21000 et seq.; Cal. Code Regs., tit. 14, § 15386). CDFW is also considered a **Responsible Agency** if a project would require discretionary approval, such as a California Endangered Species Act (CESA) Incidental Take Permit (ITP), a Native Plant Protection Act Permit, a Lake and Streambed Alteration (LSA) Agreement, or approval under other provisions of the Fish and Game Code that afford protection to the state's fish and wildlife trust resources. Pursuant to our authority, CDFW has the following comments and recommendations regarding the Project.

PROJECT DESCRIPTION AND LOCATION

The Project would strengthen and raise the San Rafael Avenue and Beach Road levees, create a new coastal flood barrier along segments of West Shore Road, and install a linear park feature on Beach Road in the City of Belvedere, Marin County. Project activities include installing sheet pile walls, concrete floodwalls, and landscaping. The objective of the Project is to protect life and property from flooding due to sea level rise and earthquake risk.

The CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.) require that the draft EIR incorporate a full Project description, including reasonably foreseeable future phases of the Project, that contains sufficient information to evaluate and review the Project's environmental impact (CEQA Guidelines, §§ 15124 & 15378). Please include a complete description of the following Project components in the Project description, as applicable:

- Footprints of permanent Project features and temporarily impacted areas, such as staging areas and access routes.

- Area and plans for any proposed structures, ground disturbing activities, fencing, paving, stationary machinery, landscaping, floodwalls or levees, and stormwater systems. Include projected sea level rise elevations on plans.

- Operational features of the Project, including level of anticipated human presence (describe seasonal or daily peaks in activity, if relevant), artificial lighting/light reflection, noise, traffic generation, and other features.

- Construction schedule, activities, equipment, and crew sizes for each phase of the Project.

REGULATORY REQUIREMENTS

California Endangered Species Act

Please be advised that a CESA ITP must be obtained if the Project has the potential to result in take[1] of plants or animals listed under CESA, either during construction or over the life of the Project. If the Project will impact CESA listed species, including but not limited to those identified in **Attachment 1: Special-Status Species**, early consultation with CDFW is encouraged, as significant modification to the Project and mitigation measures may be required to obtain an ITP. Issuance of an ITP is subject to CEQA documentation; the CEQA document must specify impacts, mitigation measures, and a mitigation monitoring and reporting program.

CEQA requires a Mandatory Finding of Significance if a Project is likely to substantially restrict the range or reduce the population of a threatened or endangered species (Pub. Resources Code, §§ 21001, subd. (c), 21083; CEQA Guidelines, §§ 15380, 15064, & 15065.). Impacts must be avoided or mitigated to less than significant levels unless the CEQA Lead Agency makes and supports Findings of Overriding Consideration (FOC). The Lead Agency's FOC does not eliminate the Project proponent's obligation to comply with CESA.

Nesting Birds

CDFW also has authority over actions that may disturb or destroy active nest sites or take birds. Fish and Game Code sections 3503, 3503.5, and 3513 protect birds, their eggs, and nests. Migratory birds are also protected under the federal Migratory Bird Treaty Act.

[1] Take is defined in Fish and Game Code section 86 as hunt, pursue, catch, capture, or kill, or attempt any of those activities.

Fully Protected Species

Fully Protected species, such as white-tailed kite (*Elanus leucurus*), California Ridgway's rail (*Rallus obsoletus obsoletus*), California black rail (*Laterallus jamaicensis coturniculus*), American peregrine falcon (*Falco peregrinus anatum*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), California brown pelican (*Pelecanus occidentalis californicus*) and salt-marsh harvest mouse (*Reithrodontomys raviventris*), may not be taken or possessed at any time (Fish & G. Code, §§ 3511, 4700, 5050, & 5515).

ENVIRONMENTAL SETTING

The draft EIR should provide sufficient information regarding the environmental setting ("baseline") to understand the Project's, and its alternative's (if applicable), potentially significant impacts on the environment (CEQA Guidelines, §§ 15125 & 15360).

CDFW recommends that the draft EIR provide baseline habitat assessments for special-status plant, fish, and wildlife species located and potentially located within the Project area and surrounding lands, including but not limited to all rare, threatened, or endangered species (CEQA Guidelines, § 15380). The draft EIR should describe aquatic habitats, such as wetlands, salt marsh, tidal mud flats, vernal pools, and/or waters of the U.S. or State, and any sensitive natural communities, eelgrass beds, or riparian habitat occurring on or adjacent to the Project site (for sensitive natural communities see: https://wildlife.ca.gov/Data/VegCAMP/Natural-Communities#sensitive%20natural%20communities). Fully protected, threatened or endangered, and other special-status species that are known to occur, or have the potential to occur in or near the Project area, include but are not limited to, those listed in **Attachment 1: Special-Status Species**. The Project area appears to be mostly developed and may not provide habitat or be in close proximity to habitat for all species in Attachment 1. As noted above, the draft EIR should identify whether habitat is present and discuss the potential for special-status species presence.

Habitat descriptions and the potential for species occurrence should include information from multiple sources, such as aerial imagery; historical and recent survey data; field reconnaissance; scientific literature and reports; the U.S. Fish and Wildlife Service's (USFWS) Information, Planning, and Consultation System; 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 draft EIR should adequately assess which special-status species are likely to occur on or near the Project site, and whether they could be impacted by the Project.

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://wildlife.ca.gov/Conservation/Survey-Protocols.

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 species potentially impacted by the Project within the Project area and adjacent habitats that may be indirectly impacted by, for example, changes to hydrology, and require the identification of reference populations. More than one year of surveys may be necessary given environmental conditions. Please refer to CDFW protocols for surveying and evaluating impacts to rare plants, and survey report requirements (https://wildlife.ca.gov/Conservation/Plants).

IMPACT ANALYSIS AND MITIGATION MEASURES

The draft EIR should discuss all direct and indirect impacts (temporary and permanent), including reasonably foreseeable impacts, that may occur with implementation of the Project (CEQA Guidelines, §§ 15126, 15126.2, & 15358). This includes evaluating and describing impacts such as:

- Encroachments into riparian habitats, drainage ditches, wetlands, eelgrass beds, San Francisco Bay, or other sensitive areas.
- Potential for impacts to special-status species or sensitive natural communities.
- Loss or modification of breeding, nesting, dispersal, and foraging habitat, including vegetation removal, alteration of soils and hydrology, and removal of habitat structural features (e.g., snags, rock outcrops, 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.

The draft EIR should also identify reasonably foreseeable future projects in the Project vicinity, disclose any cumulative impacts associated with these projects, determine the significance of each cumulative impact, and assess the significance of the Project's contribution to the impact (CEQA Guidelines, § 15355). Although a project's impacts may be less-than-significant individually, its contributions to a cumulative impact may be considerable; a contribution to a significant cumulative impact, e.g., reduction of habitat for a special-status species, should be considered cumulatively considerable.

Based on the comprehensive analysis of the direct, indirect, and cumulative impacts of the Project, the CEQA Guidelines direct the Lead Agency to consider and describe all

feasible mitigation measures to avoid potentially significant impacts in the draft EIR, and mitigate potentially significant impacts of the Project on the environment (CEQA Guidelines, §§ 15021, 15063, 15071, 15126.4 & 15370). This includes a discussion of impact avoidance and minimization measures for special-status species, which are recommended to be developed in early consultation with CDFW, USFWS, and the National Marine Fisheries Service. Project-specific measures should be incorporated as enforceable Project conditions to reduce impacts to biological resources to less-than-significant levels.

Fully protected species such as white-tailed kite, California Ridgway's rail, California black rail, California brown pelican, bald eagle, golden eagle, American peregrine falcon, and salt-marsh harvest mouse, may not be taken or possessed at any time (Fish & G. Code, §§ 3511, 4700, 5050, & 5515). Therefore, the draft EIR should include measures to ensure complete avoidance of these species.

ENVIRONMENTAL DATA

CEQA requires that information developed in EIRs and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations (Pub. Resources Code, § 21003, subd. (e)). Accordingly, please report any special-status species and natural communities detected during Project surveys to CNDDB. The CNNDB online field survey form and other methods for submitting data can be found at: https://wildlife.ca.gov/Data/CNDDB/Submitting-Data. The types of information reported to CNDDB can be found at: https://wildlife.ca.gov/Data/CNDDB/Plants-and-Animals.

FILING FEES

CDFW anticipates that the Project will have an impact on fish and/or wildlife, and assessment of filing fees is necessary (Fish & G. Code, § 711.4; Pub. Resources Code, § 21089). Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW.

If you have any questions, please contact Amanda Culpepper, Environmental Scientist, at (707) 428-2075 or amanda.culpepper@wildlife.ca.gov, or Melanie Day, Senior Environmental Scientist (Supervisory), at (707) 210-4415 or melanie.day@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Erin Chappell
B77E9A6211EF486...

Erin Chappell
Regional Manager
Bay Delta Region

Attachment 1: Special-Status Species

ec: State Clearinghouse (SCH No. 2022010159)

Arn Aarreberg, CDFW Marine Region, arn.aarreberg@wildlife.ca.gov

Amy Skewes-Cox, City of Belvedere Consultant, amysc@rtasc.com

Attachment 1: Special-Status Species

Scientific Name	Common Name	Status
Birds		
Rallus obsoletus obsoletus	California Ridgway's rail	CESA and Endangered Species Act (ESA) listed as endangered; California Fully Protected species
Laterallus jamaicensis coturniculus	California black rail	CESA listed as threatened; California Fully Protected species
Haliaeetus leucocephalus	bald eagle	CESA listed as endangered; California Fully Protected species; Bald and Golden Eagle Protection Act
Charadrius nivosus nivosus	western snowy plover	ESA listed as threatened; California Species of Special Concern (SSC)
Aquila chrysaetos	golden eagle	California Fully Protected species; Bald and Golden Eagle Protection Act
Lanius ludovicianus	loggerhead shrike	SSC
Circus hudsonius	northern harrier	SSC
Geothlypis trichas sinuosa	saltmarsh common yellowthroat	SSC
Melospiza melodia samuelis	San Pablo song sparrow	SSC
Coturnicops noveboracensis	yellow rail	SSC
Elanus leucurus	white-tailed kite	California Fully Protected species
Falco peregrinus anatum	American peregrine falcon	California Fully Protected species
Pelecanus occidentalis californicus	California brown pelican	California Fully Protected species

Fish		
Spirinchus thaleichthys	longfin smelt	CESA listed as threatened; candidate for ESA listing
Oncorhynchus tshawytscha pop. 7	Sacramento River winter-run Chinook salmon	CESA and ESA listed as endangered
Oncorhynchus tshawytscha pop. 11	Central Valley spring-run Chinook salmon	CESA and ESA listed as threatened
Acipenser medirostris	green sturgeon	Southern Distinct Population Segment ESA listed as threatened; SSC
Oncorhynchus mykiss irideus pop. 8	central California coast steelhead	ESA listed as threatened
Culpea pallasii	Pacific herring	Culturally and historically important fishery managed by CDFW
Amphibians		
Rana draytonii	California red-legged frog	ESA listed as threatened; SSC
Mammals		
Reithrodontomys raviventris	salt-marsh harvest mouse	CESA and ESA listed as endangered; California Fully Protected species
Corynorhinus townsendii	Townsend's big-eared bat	SSC
Antrozous pallidus	pallid bat	SSC
Lasiurus blossevillii	western red bat	SSC
Reptiles		
Emys marmorata	western pond turtle	SSC

Invertebrates		
Icaricia icarioides missionensis	Mission blue butterfly	ESA listed as endangered; ICP
Danaus plexippus pop. 1	monarch - California overwintering population	ESA candidate for listing; California Terrestrial and Vernal Pool Invertebrate of Conservation Priority (ICP)[2]
Bombus occidentalis	western bumble bee	ICP
Microcina tiburona	Tiburon micro-blind harvestman	ICP
Plants		
Arenaria paludicola	marsh sandwort	CESA and ESA listed as endangered; CRPR 1B.1
Calochortus tiburonensis	Tiburon mariposa-lily	CESA and ESA listed as threatened; CRPR 1B.1
Castilleja affinis var. *neglecta*	Tiburon paintbrush	CESA listed as threatened; ESA listed as endangered; CRPR 1B.2
Hesperolinon congestum	Marin western flax	CESA and ESA listed as threatened, CRPR 1B.1
Pentachaeta bellidiflora	white-rayed pentachaeta	CESA and ESA listed as endangered; CRPR 1B.1
Streptanthus glandulosus ssp. *niger*	Tiburon jewelflower	CESA listed as endangered; CRPR 1B.1
Trifolium amoenum	two-fork clover	ESA listed as endangered; CRPR 1B.1
Amorpha californica var. *napensis*	Napa false indigo	CRPR 1B.2

[2] The list of California Terrestrial and Vernal Pool Invertebrates of Conservation Priority was collated during CDFW's Scientific Collecting Permit rulemaking process: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=157415&inline

Calystegia purpurata ssp. *saxicola*	coastal bluff morning-glory	CRPR 1B.2
Chloropyron maritimum ssp. *palustre*	Point Reyes salty bird's-beak	CRPR 1B.2
Cirsium andrewsii	Franciscan thistle	CRPR 1B.2
Collinsia multicolor	San Francisco collinsia	CRPR 1B.2
Eriogonum luteolum var. *caninum*	Tiburon buckwheat	CRPR 1B.2
Fritillaria lanceolata var. *tristulis*	Marin checker lily	CRPR 1B.1
Gilia millefoliata	dark-eyed gilia	CRPR 1B.2
Helianthella castanea	Diablo helianthella	CRPR 1B.2
Hypogymnia schizidiata	island tube lichen	CRPR 1B.3
Kopsiopsis hookeri	small groundcone	CRPR 2B.3
Microseris paludosa	marsh microseris	CRPR 1B.2
Plagiobothrys glaber	hairless popcornflower	CRPR 1A
Polemonium carneum	Oregon polemonium	CRPR 2B.2
Polygonum marinense	Marin knotweed	CRPR 3.1
Silene scouleri ssp. *scouleri*	Scouler's catchfly	CRPR 2B.2
Stebbinsoseris decipiens	Santa Cruz microseris	CRPR 1B.2
Triquetrella californica	coastal triquetrella	CRPR 1B.2

February 10, 2022

Ms. Amy Skewes-Cox
Environmental Planner
P.O Box 422
Ross, CA 94957

RE: Belvedere Critical Infrastructure Project Scope & EIR

Thank you for the informative zoom meeting on February 9 re the CEQA process for the Critical Infrastructure Project. As part of the potential impacts that will be studied by the project's environmental firm, we would like to submit the following:

As residents living on Beach Road we would like to suggest that the following issues be addressed in the EIR and/or by other means. Please address impacts during each phase of construction and at the conclusion of the project:

Access for ambulance, fire and other emergency services to individual buildings on Beach Road:

Parking and Delivery Services for Beach Road Residents:

- Number and location of on-street spaces available for Resident Parking.
- Accommodation for residential deliveries for each building (including Trash, Garbage and Recycling, Grocery, Mail and other delivery services).

As background to the above access issues we believe you are aware that many of the residents on Beach Road are elderly and many have disabilities. Further, garages are not available to homes on the waterside of Beach Road between 16 Beach and the San Francisco Yacht Club. And since June of 2021 eleven garages at 2 Barn Road are no longer available for residents in the neighborhood. This has been difficult in terms of demand for on-street parking spaces for residents and we believe this should be addressed as part of the impact of future changes.

Clarify responsibility of City and individual landlords/ property owners along Beach Road for the physical interface between new and existing walkways and building entries.

Aesthetics:

We believe the EIR should comment on the Sea Wall design in terms of aesthetics (articulation; architectural quality of materials; color or color mix, and form liners if concrete is used. Note a "utility construction standard" should not be acceptable aesthetics for the Sea Wall or Walkways. We assume the EIR will address:

Sea Wall design and construction standards.

Walkway design and construction standards.

New linear park (with enhanced landscaping along both levies) design and construction standards.

Street Lighting standards.

Signage standards.

Accessibility design standards.

Sustainability design standards.

Sea Level Rise Assumptions:

Is there agreement on the sea level assumptions for the future to be used as a basis for design of Belvedere's Critical Infrastructure Project? How do sea level rise assumptions used as the basis of design compare with current assumptions by various State and Federal agencies?

Coordination with Tiburon:

What is the necessary coordination needed with Tiburon's program(s) related to critical infrastructure projects? Is the necessary coordination in-place?

Schedule of Construction:

We are also very interested on the specific schedule of construction and the timetable impacts for residents living on Beach Road. Will there be any necessity to move out of any individual units during construction, and if so, will this be identified in the EIR?

Sincerely,

Sherry T. Caplan & John P. Sheehy, FAIA, RIBA
18 Beach Road
Belvedere, CA 94920

Chloe Byruck
On Behalf of the Belvedere Land Company
83 Beach Rd
Belvedere, CA 94920

February 9, 2022

Ms. Amy Skewes-Cox
Environmental Planner
PO Box 422
Ross, CA 94957
Cc Mr. Robert Zadnik
Public Works Director

RE: Belvedere Critical Infrastructure Project

Dear Ms. Amy Skewes-Cox and Mr. Robert Zadnik,

We have reviewed the Notice of Preparation and would like to comment on the scope and content of the study for the EIR.

You note that "the EIR will address the following potential environmental effects: Aesthetics, Air Quality, Biological Resources, Cultural Resources, Energy, Tribal Cultural Resources, Energy, Geology/Soils, Hazards, Noise, Public Services, Recreation, Greenhouse Gas Emissions, Hydrology and Water Quality, Land Use, Transportation/ Traffic, Utilities, and Wildfire."

May we suggest that you please address the following topics:

1. Alternatives to the sea wall on Beach Road, such as a flood barrier that is being proposed on West Shore; or other interventions such as rip-rap, wave deflection systems, etc.
2. Construction and design and access impacts on the bayside buildings and tenants
3. Construction, design, timing and permitting coordination with the bayside buildings

4. Noise, aesthetics, and land use considerations for the park areas to avoid creating problems for the people living along Beach Road
5. Aesthetic considerations for the railings and other improvements
6. Consideration of impacts of drainage lines
7. Consideration of future ADA requirements along Beach Road's north side sidewalk
8. Analysis of parking and how to maintain adequate parking spaces and access to those parking spaces for residents
9. Consideration of the location of sheet piling, including assessing the need for sheet piling on the North side of Beach Road in addition to the south side
10. Alternatives to or solutions for the gaps in the sea wall that leave the area seemingly exposed to flooding (at the eastern end of Beach Road, at the End of San Rafael Ave, and at the whole eastern/Tiburon side of the area)
11. Alternatives to treatment of the Historic Resources (the historic buildings and their sites) on Beach Road
12. Consideration for why the flood wall height ranges from 11.9-12.3 NAVD on Beach Road, and 10.8 NAVD on West Shore Road and 12.4 on San Rafael

Sincerely,

Chloe Byruck

FEDERATED INDIANS OF
GRATON
RANCHERIA

Submitted via electronic e-mail: iborba@cityofbelvedere.org

February 10, 2022

RE: Formal Request for Tribal Consultation Pursuant to the California Environmental Quality Act (CEQA), Public Resources Code section 21080.3.1, subds. (b), (d) and (e) for the *Critical Infrastructure Project in the City of Belvedere.*

Dear Agency Representative:

This letter constitutes a formal request for tribal consultation under the provisions of the California Environmental Quality Act (CEQA) (Public Resources Code section 21080.3.1 subdivisions (b), (d) and (e) for the mitigation of potential project impacts to tribal cultural resources for a project within the Federated Indians of Graton Rancheria's ancestral lands.

Receiving this letter sets forth the Tribe's formal request for consultation on the following topics checked below, which shall be included in consultation if requested (Public Resources Code section 21080.3.2, subd. (a)):

___x__ Alternatives to the project
___x__ Recommended mitigation measures
___x__ Significant effects of the project

The Tribe also requests consultation on the following discretionary topics checked below (Public Resources Code section 21080.3.2, subd. (a)):

___x__ Type of environmental review necessary
___x__ Significance of tribal cultural resources, including any regulations, policies or standards used by your agency to determine significance of tribal cultural resources
___x__ Significance of the project's impacts on tribal cultural resources
___x__ Project alternatives and/or appropriate measures for preservation or mitigation that we may recommend, including, but not limited to:

(1) Avoidance and preservation of the resources in place, pursuant to Public Resources Code section 21084.3, 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 resources with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resources, including but not limited to the following:
    a. Protecting the cultural character and integrity of the resource;

b. Protection the traditional use of the resource; and
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.

Additionally, the Tribe would like to receive any cultural resources assessments or other assessments that have been completed on all or part of the project's potential "area of project effect" (APE), including, but not limited to:

(1) The results of any record search(es) conducted at an archaeological information center of the California Historical Resources Information System (CHRIS), including, but not limited to:

(a) Any known cultural resources that have already been recorded on or adjacent to the potential APE;
(b) Whether the probability is low, moderate or high that cultural resources are located in the potential APE; and
(c) If a survey is required to determine whether previously unrecorded cultural resources are present in the potential APE.

(2) The results of any archaeological inventory survey that was conducted of all or part of the potential APE, including, but not limited to:

(a) Any report that may contain site forms, site significance, and suggested mitigation measures.

(3) The results of any Sacred Lands File searches conducted through the Native American Heritage Commission for all or part of the potential APE;
(4) Any ethnographic studies conducted for any area including all or part of the potential APE;
(5) Any geotechnical reports regarding all or part of the potential APE; and
(6) The administrative drafts of all environmental documents.

We would like to remind your agency that CEQA Guidelines section 15126.4, subdivision (b)(3) states that preservation in place is the preferred manner of mitigating impacts to archaeological sites. Section 15126.4, subd. (b)(3) of the CEQA Guidelines has been interpreted by the California Court of Appeal to mean that "feasible preservation in place must be adopted to mitigate impacts to historical resources of an archaeological nature unless the lead agency determines that another form of mitigation is available and provides superior mitigation of impacts." *Madera Oversight Coalition v. County of Madera* (2011) 199 Cal.App.4th 48,

FEDERATED INDIANS OF
GRATON
RANCHERIA

disapproved on other grounds, *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th 439.

The Tribe would like to begin consultation within 30 days of your receipt of this letter. Please contact my office at (707) 566-2288 or by email at bmcquillen@gratonrancheria.com as the person who will serve as the lead contact on behalf of the Tribe.

Sincerely,

Buffy McQuillen, THPO/NAGPRA
Federated Indians of Graton Rancheria

Gmail

Amy Skewes-Cox <amysc@rtasc.com>

Submission for February 9, NOP/EIR

1 message

w1rothman@gmail.com <w1rothman@gmail.com> Tue, Feb 1, 2022 at 3:28 PM
To: amysc@rtasc.com
Cc: Robert Zadnik - Public Works Director <rzadnik@cityofbelvedere.org>, w1rothman@gmail.com

Please Acknowledge, by email, Receipt of this Document.

From William Rothman, MD

14 Cliff Road

Belvedere, California

To:

Ms. Amy Skewes-Cox, Environmental Planner, PO Box 422, Ross, CA 94957. amysc@rtasc.com

Please find, below, public submission for consideration, by NOP consultants, of defects in current Belvedere NOP-process submission.

Please Acknowledge, by email, Receipt of this Document.

(A) Beach Road and Lagoon defect issues

1) Plan ignores Consultants-pointed to, inevitable water flooding into Belvedere from Tiburon, flood zone, getting trapped on land side of Beach Road proposed wall, and, so, channeled into inundate Belvedere Lagoon homes. His testimony reflecting this problem is to be found on the audio-tape of the June 3, 2019 meeting of the Committee to Protect Belvedere's Seawalls, Levees and Utilities, at the following time citations: minutes 7, 15, and 51-59 of the recording, **and By Testimony, at that same meeting, of James Reilly, Principal Engineer of Stetson Engineering, the Engineering firm of Record for the Project.**

And, that same plan-problem is pointed at by James Reilly, Principal Engineer for Stetson Engineering, the projects engineer of record, at minutes 51-59 of the June 3 meeting.

Finally, that same problem, of whether there is any way to correct the Belvedere flooding problem caused by the lack of a Tiburon wall, is pointed to by Mayor Bob McCaskill, at the Committee's June 6, meeting, as reflected in the meeting tape, at approximately minute 38, in his statement: "We can't tell Tiburon what to do."

Please consider this analogous situation

Belvedere's "Maginot Line"

The pictures, below, may seem unrelated. One shows the failed World War II Maginot Line and the other, separated from the first by 80 years and 8,000 miles, is of the Tiburon-Belvedere boundary. But there are lessons from the first picture to which Belvedere planners have neglected to give due heed.

History instructs, that the World War 2, Maginot Line (**solid red line,** left picture), a heavily fortified series of redoubts built on on France's border to prevent German invasion, completely failed in that purpose, for on obvious reason: German forces simply went around its northern end, and "flooded" into France.

Unfortunately, that same “incompleteness” flaw is demonstrated in the picture of the Tiburon-Belvedere Boundary, by the white dotted line. That dotted line ,shows where **No wall is Planned**, thereby causing flood water from Tiburon to flood into Belvedere’s lagoon homes area.

In the event of sea level rise sufficient to require a Beach Road wall, and also, of course, therefore sufficient to cause flooding across Tiburon’s Main Street water frontage, Tiburon flood water will, as the arrows show, flow across Tiburon’s lowland parking lot directly into Belvedere, because Belvedere’s $28,000,000 Seawall plan completely ignores the need for a Belvedere-protecting, Tiburon wall.

Further evidence of the failure of the plan to deal with the problem of Tiburon flood water coming into Belvedere, because of lack of a wall o prevent that I is reflected by Mayor MacAskill's audio-recorded statement, at the June 6 meeting of the Committee to protect belvedere's seawalls, levees and utilities, about that problem, at approximately minute 38, to quote him: "We can't tell Tiburon what to do."

This plan defect makes, at least the aspect of the project described above, actually environmentally dangerous, and therefore unacceptable as currently configured.

(B) San Rafael Avenue project defects needing plan modifications, because current plan ignores, as explained below, the plans failure to protect, from earthquake damage, portions of watermains providing all of Belvederes water.

Although the San Rafael sheet piling would protect, from earthquake damage, the drinking water main, which runs under those portions of San Rafael Avenue where the sheet piling would be placed, The San Rafael Avenue sheet piling would fail to protect the following:

1) It would fail to protect the water mains carrying all of Belvedere's water supply, due to its failure to, in the aggregate, shield from earthquakes, those unprotected large mains including:

a) The largest water main carrying all of Belvedere's water. That main comes off of a Tiburon Blvd main, and then is under San Rafael Avenue for a short distance, and then bifurcates intp a main that continues along San Rafael Avene, and a main that runs along lagoon Road. Actually, the Lagoon road main. Wich, like the San Rafael main is in mud, is 1/3 larger than that portion of the

San Rafael main which will be protected by the Sheet piling, and the Lagoon road larger main is also in mud.

This creates a situation where there is no sheet piling earthquake protection of:

b) The large water main coming off of Tiburon Blvd, which provides all of Belvedere's water.

c) The lagoon road Main water main which is in mud.

d) The portion of the San Rafael Avenue main water line running between the bifurcation of the major common main coming off of Tiburon Blvd, and the portion of the San Rafael Avenue water main which is behind the sheet piling.

These defects show that the plan, as now configured, would not result in its claimed, and desired, described earthquake-damage-to-water mains, and so must be modified to do so.

3) Plan fails to evaluate potential property damage to homes along San Rafael Avenue, and Buildings along Beach road, which damage could result from Pile- Driving of Sheet Pilings.

Plan must be modified to recognize, and prevent, these potential damages.

4) Traffic Dangers from elimination of Beach Road raised median. The plan's planned removal of that median will, because that traffic separation will no longer be present, increase the likelihood of Head-on auto collisions on Beach Road. This is an obvious negative potential impact on people, as is the fact that the removal of the median will eliminate a place, between traffic flows where people with disabilities, which cause them to move slowly, can stop in an area, at the ends of the median's sections, but still protected, by the medians, from being struck by motorvehicles.

5) Challenge regarding whether official plan drawings and other submissions actually represent what is intended to be constructed. This challenge is asserted on the basis of the following evidence.

At the November 29, 2021 City Council meeting, at approximately minute 44 of the audio tape of the meeting, the City Manager, in describing the approach that the city will take in seeking grants for the construction, states that the language of the application for a Coastal Conservance grant will make it clear, because the coastal conservanvy favors such, that the project will provide for improved access to bay waters. Yet, the plan as currently configured provides no such element. That raises the question of whether the plan, as currently configured, which, as so configured, is that upon which the EIR study is assumed to be based, actually what is planned, since the City Manager's statement cannot be reconciled with documents submitted for EIR evaluation. This apparent contradiction must be resolve, or the EIR study cannot be regarded as valid.

6) Challenge to plan due to failure, with respect to utility pipes and conduit potential earthquake damage, to consider alternative of use of more resilient conduit material, rather than expensive, external sheet piling approach.

For instance, plan documents show no evidence, with respect to water pipe strengthening, of replacing existing water pipes with newer more resilient pipes, such as those used by EBMUD, 2 years ago, when, based upon Japanese experience with stronger pipes, that had gone through

strong earthquakes, without difficulty, actually selected such pipe material when it replace large water mains that ran right across the Hayward Fault. The current plans show no indication of these kinds of increased-resiliency, much less expensive approaches having been investigated. Such investigations must be done before the plan proceeds, if for no other reason than thatpf possible detrimental environmental effects if the materials use are not adequate, and breakage occurs.,

Respectfully submitted,

William Rothman

List of Officials and Expert Consultants, the contents of whose presentations are Cited above:

Mayor Bob McCaskill.

James Reilly, Principle Engineer, Stetson Engineering, Engineers of Record.

Professor Mattjis Bouw, Principal, One Architecture, Netherlands-based, World-wide renown consultant experts in Flood Control Planning

Gmail

Amy Skewes-Cox <amysc@rtasc.com>

Supplemental input for Belvedere NOP/EIR

w1rothman@gmail.com <w1rothman@gmail.com> Sat, Feb 5, 2022 at 8:35 PM
To: amysc@rtasc.com, Robert Zadnik - Public Works Director <rzadnik@cityofbelvedere.org>

Suppplemental NOP submission

From William Rothman

14 Cliff Road

Belvedere, ca 94920

To:

Ms. Amy Skewes-Cox, Environmental Planner, PO Box 422, Ross, CA 94957. amysc@rtasc.com

Please acknowledge receipt of the NOP/EIR scoping input.

1. Failure of project plan, regarding claimed need for sheet piling to protect San Rafael Avenue Roadway and utilities, to evaluate, in terms of earthquake damage, the effect on such, based upon distance from San Rafael Avenue, and Depth of Earthquake, as well as its magnitude. This information is lacking, but is necessary, in order to know likelihood of risk, if any, imposed by not placing sheet piling protection along San Rafael Avenue..

2) Failure of project evaluation, to evaluate the extra degree of earthquake damage that would occur, just beyond both end of the San Rafael Avenue sheet piling, due to much greater earthquake caused damage at such sites, because of sharp angle torsion caused by markedly less pressure on utilities, and roadway behind sheet piling, compared to much greater torsion on same, just beyond ends of sheet piling. This extra damage-causing is sometimes referred to as the “End Effect”. The lack of inclusion of this evaluation in he project plans precludes being able to know to what degree, of any the presence of the sheet piling would make damage to San Rafael Avenue pavement and San Rafael Avenue utilities more or less severe, compared to doing nothing, or to using other strengthening techniques.

3) Plans provided in the past have showed narrowing of the San Rafael Avenue pavement available for vehicles and bicycles to move on. I have inquired of the Public Works Director, as to whether more recent plans have chaned in that regard, but he has refused to provide a reponse. For that reason, I am assuming that the plans still show such a naroowing, and feel that this will endanger bicyclists, especially children riding in the Roadway, due to such narrowing causing them to be hit by cars. At the present time, it is impossible, on several portions of bay front san Rafael avenue, for vehicles to have enough space to provide the leaglly-required 3 feet of clearance for bicycles, without crossing the center line, which is illegal in that area. Further narrowing, as proposed, as noted above, would create greater such danger.

Sincerely,

William Rothman

Gmail

Amy Skewes-Cox <amysc@rtasc.com>

Request for clarification

1 message

w1rothman@gmail.com <w1rothman@gmail.com> Mon, Feb 7, 2022 at 1:12 PM
To: Amy Skewes-Cox <amysc@rtasc.com>
Cc: cmiddleton@cityofbelvedere.org, jlynch@cityofbelvedere.org, swilkinson@cityofbelvedere.org, jcampbell@cityofbelvedere.org, sblock@cityofbelvedere.org, nkemnitzer@cityofbelvedere.org, Shayne Jones <sjones@thearknewspaper.com>, editor@thearknewspaper.com

From William Rothman

Dear Ms. Skewes-Cox:

Please acknowledge receipt of this email, titled Request for clarification of input parameters, for NOP/EIR.

I am writing to request an explanation of what I find to be a confusing a statement you have provided for the aenda announcement, for the Belvedere NOP/EIR, February 9, Belvedere meeting.

Here is your statement which I find confusing.:

2. Opportunity for public comments. Comments should be focused on the potential environmental impacts of the project, and not on the project itself. This scoping meeting is intended to help frame the analysis of the EIR, and comments presented this evening will be summarized in the EIR. Written comments will be included as an appendix to the EIR.

You state: "Comments should be focused on the environmental impacts of the project and not on the project itself". Although I can hardly imagined to communicate the idea that, even though there are many environmental impacts that would not even exist if the project were not to exist, that public comments should not even mention that it is the project that will cause the environmental impacts. Kjnd of like we should take the approach that the environmental impacts of the project, sort of "fall out of the sky, or something". Ms. Skewes-Cox, in my opinion that restriction, as you have worded it, does not make sense. Please clarify what you mean. As regards ,submissions, you will find that, each and every one references an environmental impact, each and everyone of them also notes that each and every one of them is caused by the project. I could not do otherwise, unless I believed that the environmental impacts did, indeed, so to speak, "fall out of the sky", and I do not believe that. I believe they will be brought about by the project, itself.

Please clarify the meaning of the parameters of input your statement describes.

Thank you for your help.

Sincerely,

William Rothman

From: Amy Skewes-Cox <amysc@rtasc.com>
Sent: Monday, February 7, 2022 11:14 AM
To: w1rothman@gmail.com
Cc: Robert Zadnik - Public Works Director <rzadnik@cityofbelvedere.org>
Subject: Re: Supplemental input for Belvedere NOP/EIR

Thank you for your comments. Amy

On Sat, Feb 5, 2022 at 8:36 PM <w1rothman@gmail.com> wrote:

> Suppplemental NOP submission
>
> From William Rothman
>
> 14 Cliff Road
>
> Belvedere, ca 94920

To:

Ms. Amy Skewes-Cox, Environmental Planner, PO Box 422, Ross, CA 94957. amysc@rtasc.com

Please acknowledge receipt of the NOP/EIR scoping input.

1. Failure of project plan, regarding claimed need for sheet piling to protect San Rafael Avenue Roadway and utilities, to evaluate, in terms of earthquake damage, the effect on such, based upon distance from San Rafael Avenue, and Depth of Earthquake, as well as its magnitude. This information is lacking, but is necessary, in order to know likelihood of risk, if any, imposed by not placing sheet piling protection along San Rafael Avenue..

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Sincerely,

William Rothman

--

Amy Skewes-Cox, AICP, Environmental Planning

Cellphone 415-203-0454

Website: www.rtasc.com

Pronouns: she/her/hers

Gmail

Amy Skewes-Cox <amysc@rtasc.com>

Additional February 10, Supplemental submission for NOP/EIR

1 message

w1rothman@gmail.com <w1rothman@gmail.com> Thu, Feb 10, 2022 at 7:24 AM
To: Amy Skewes-Cox <amysc@rtasc.com>
Cc: Robert Zadnik - Public Works Director <rzadnik@cityofbelvedere.org>, editor@thearknewspaper.com, Shayne Jones <sjones@thearknewspaper.com>

From William Rothman

14 Cliff Road

Belvedere, Ca 94920

I am providing this additional input to the NOP/EIR

Please Acknowledge receipt of this February 10, NOP/EIR input.

1. Because, as the audio of the February 9, meeting shows, Ms. Skewes-Cox stated that an engineer for Stetson, the company that designed the project, as propose, would be a member of the EIR firm's "Team", evaluating all issues involving the Draft EIR, and final EIR, including challenges to the plan that Stetson, itself created, I am writing to suggest that his involvement in that process of evaluating the very plan that his firm created, constitutes a conflict of interest which would invalidate the supposed neutrality of the NOP/EIR process.
2. At the February 9, meeting Mr. Zadnick testified to the fact that the driving portions of Beach Road would be narrowed. I wish to object to that, because it would create additional dangers for the many bicyclists who ride on that street, and who, consequently would be more likely to be hit by cars.

Thank you for your attention.

Please Acknowledge receipt of this February 10, NOP/EIR input.

Sincerely,

William Rothman

Gmail

Amy Skewes-Cox <amysc@rtasc.com>

RE: EIR Public Comment

1 message

Suzanne Du Molin <sdumolin@drs1.com> Thu, Feb 10, 2022 at 3:28 PM
To: "amysc@rtasc.com" <amysc@rtasc.com>
Cc: Robert Zadnik <rzadnik@cityofbelvedere.org>, "clerk@cityofbelvedere.org" <clerk@cityofbelvedere.org>

Dear Amy and Robert,

Below is my “final” submission for this round of the EIR study. You may replace both my February 7th and February 8th submissions with the one below.

Thank you,

Suzanne Du Molin
(415) 435-5870

Dear Amy and Robert,

With respect to the EIR for the Belvedere project, I have the following specific questions and comments:

1. For San Rafael Avenue, how high would the walkway be elevated, at its highest point?

2. For Beach Road, how high would the walkway be elevated, at its highest point?

3. Would San Rafael Avenue be raised in any portion of the street? If so, how much? What would be the impact to traffic, pedestrians, and what would be the visual impact?

4. Would Beach Road be raised in any portion of the street? If so, how much? What would be the impact to traffic, pedestrians, and what would be the visual impact?

As I stated yesterday, I am concerned about the visual impact of these walls and elevated pathways, and I would like to see scale drawings that show the relative height of the walls, with pedestrians on the pathways at the top and various points along the distance of the pathways, in relation to pedestrians and cars at street level, and existing structures. I would like to see these drawings for both San Rafael Avenue and Beach Road, before the voters are asked to approve this project.

Also, I am concerned about traffic impact during construction, if this project goes forward.

1. For San Rafael Avenue: how long would construction last, how long will traffic be confined to one lane, and how long will both lanes be closed to traffic?

2. For Beach Road: how long would construction last, how long will traffic be confined to one lane, and how long will both lanes be closed to traffic?

3. Further, for Beach Road: currently there is one lane of traffic in each direction, separated by a median. Since Beach Road would become narrower, I am concerned about the safety of cars sharing a narrower road with bicycles.

I am concerned about construction noise during what seems likely to be a long construction period.

Thank you for addressing all these issues.

Sincerely,

Suzanne Du Molin
(415) 435-5870

APPENDIX B
AIR QUALITY DATA

Belvedere Levee v2 Custom Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Belvedere Levee v2
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.90
Precipitation (days)	7.60
Location	37.873711994950455, -122.4620850471729
County	Marin
City	Belvedere
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	930
EDFZ	2
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
User Defined Linear	1.00	Mile	1.00	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	3.73	2.31	24.2	57.4	0.12	0.35	1.62	1.96	0.33	0.32	0.66	—	19,152	19,152	1.50	1.60	55.1	19,723
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	2.14	1.29	14.6	28.8	0.07	0.21	0.95	1.16	0.20	0.19	0.39	—	10,863	10,863	0.76	0.96	0.84	11,169
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	1.06	0.65	7.20	14.6	0.03	0.10	0.46	0.56	0.10	0.09	0.19	—	5,366	5,366	0.36	0.46	6.84	5,519
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	0.19	0.12	1.31	2.66	0.01	0.02	0.08	0.10	0.02	0.02	0.03	—	888	888	0.06	0.08	1.13	914

3. Construction Emissions Details

3.1. Linear, Grading & Excavation (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.36	0.33	5.07	7.95	0.01	0.12	—	0.12	0.11	—	0.11	—	1,480	1,480	0.06	0.01	—	1,485
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.36	0.33	5.07	7.95	0.01	0.12	—	0.12	0.11	—	0.11	—	1,480	1,480	0.06	0.01	—	1,485
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.08	1.20	1.87	< 0.005	0.03	—	0.03	0.03	—	0.03	—	349	349	0.01	< 0.005	—	350
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.01	0.22	0.34	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	57.7	57.7	< 0.005	< 0.005	—	57.9
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.03	0.88	1.34	20.8	0.00	0.00	0.27	0.27	0.00	0.00	0.00	—	4,629	4,629	0.17	0.15	21.6	4,700
Vendor	0.06	0.02	0.64	0.37	< 0.005	0.01	0.02	0.03	0.01	0.01	0.01	—	407	407	0.04	0.06	1.00	426
Hauling	0.72	0.10	6.87	3.67	0.05	0.08	0.35	0.43	0.08	0.11	0.19	—	4,668	4,668	0.62	0.74	9.66	4,913
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.01	0.85	1.64	16.7	0.00	0.00	0.27	0.27	0.00	0.00	0.00	—	4,308	4,308	0.04	0.15	0.56	4,355
Vendor	0.06	0.02	0.67	0.38	< 0.005	0.01	0.02	0.03	0.01	0.01	0.01	—	407	407	0.04	0.06	0.03	425
Hauling	0.72	0.10	7.23	3.68	0.05	0.08	0.35	0.43	0.08	0.11	0.19	—	4,668	4,668	0.62	0.74	0.25	4,904
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.20	0.35	3.94	0.00	0.00	0.06	0.06	0.00	0.00	0.00	—	1,020	1,020	0.01	0.04	2.19	1,033
Vendor	0.01	< 0.005	0.16	0.09	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	95.8	95.8	0.01	0.01	0.10	100
Hauling	0.17	0.02	1.68	0.87	0.01	0.02	0.08	0.10	0.02	0.03	0.04	—	1,100	1,100	0.15	0.17	0.98	1,156
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.06	0.72	0.00	0.00	0.01	0.01	0.00	0.00	0.00	—	169	169	< 0.005	0.01	0.36	171
Vendor	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	15.9	15.9	< 0.005	< 0.005	0.02	16.6
Hauling	0.03	< 0.005	0.31	0.16	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	182	182	0.02	0.03	0.16	191

3.3. Linear, Trenching (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.30	0.27	4.31	6.81	0.01	0.08	—	0.08	0.08	—	0.08	—	1,237	1,237	0.05	0.01	—	1,242
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.30	0.27	4.31	6.81	0.01	0.08	—	0.08	0.08	—	0.08	—	1,237	1,237	0.05	0.01	—	1,242
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.10	1.56	2.46	< 0.005	0.03	—	0.03	0.03	—	0.03	—	447	447	0.02	< 0.005	—	449
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.28	0.45	< 0.005	0.01	—	0.01	0.01	—	0.01	—	74.1	74.1	< 0.005	< 0.005	—	74.3
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.75	0.64	0.97	15.1	0.00	0.00	0.20	0.20	0.00	0.00	0.00	—	3,357	3,357	0.12	0.11	15.7	3,408
Vendor	0.06	0.02	0.64	0.37	< 0.005	0.01	0.02	0.03	0.01	0.01	0.01	—	407	407	0.04	0.06	1.00	426
Hauling	0.45	0.06	4.31	2.29	0.03	0.05	0.22	0.28	0.05	0.07	0.12	—	2,966	2,966	0.39	0.47	6.15	3,122

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.73	0.62	1.19	12.1	0.00	0.00	0.20	0.20	0.00	0.00	0.00	—	3,124	3,124	0.03	0.11	0.41	3,158
Vendor	0.06	0.02	0.67	0.38	< 0.005	0.01	0.02	0.03	0.01	0.01	0.01	—	407	407	0.04	0.06	0.03	425
Hauling	0.45	0.06	4.54	2.30	0.03	0.05	0.22	0.28	0.05	0.07	0.12	—	2,966	2,966	0.39	0.47	0.16	3,116
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.26	0.22	0.39	4.39	0.00	0.00	0.07	0.07	0.00	0.00	0.00	—	1,135	1,135	0.01	0.04	2.44	1,149
Vendor	0.02	0.01	0.24	0.14	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	147	147	0.01	0.02	0.16	154
Hauling	0.16	0.02	1.62	0.83	0.01	0.02	0.08	0.10	0.02	0.02	0.04	—	1,073	1,073	0.14	0.17	0.96	1,128
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.07	0.80	0.00	0.00	0.01	0.01	0.00	0.00	0.00	—	188	188	< 0.005	0.01	0.40	190
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	24.4	24.4	< 0.005	< 0.005	0.03	25.5
Hauling	0.03	< 0.005	0.30	0.15	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	0.01	—	178	178	0.02	0.03	0.16	187

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
San Rafael Road	Linear, Grading & Excavation	2/1/2023	5/31/2023	5.00	86.0	San Rafael Ave construction
Beach Road	Linear, Trenching	5/1/2023	10/31/2023	5.00	132	Beach Road construction

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

San Rafael Road	Excavators	Diesel	Tier 4 Interim	1.00	1.10	275	0.38
Beach Road	Excavators	Diesel	Tier 4 Interim	1.00	0.72	275	0.38
San Rafael Road	Excavators	Diesel	Tier 4 Interim	1.00	2.80	354	0.38
San Rafael Road	Rubber Tired Loaders	Diesel	Tier 4 Interim	1.00	2.30	305	0.40
Beach Road	Bore/Drill Rigs	Diesel	Tier 4 Interim	1.00	2.40	354	0.50
Beach Road	Pavers	Diesel	Tier 4 Interim	1.00	0.56	320	0.42
Beach Road	Rubber Tired Loaders	Diesel	Tier 4 Interim	1.00	3.00	150	0.36
San Rafael Road	Air Compressors	Diesel	Average	1.00	0.37	37.0	0.48
San Rafael Road	Other Construction Equipment	Diesel	Tier 4 Interim	1.00	0.37	305	0.42
San Rafael Road	Cranes	Diesel	Tier 2	1.00	0.47	270	0.29
San Rafael Road	Pavers	Diesel	Tier 4 Interim	1.00	1.00	320	0.42
San Rafael Road	Paving Equipment	Diesel	Tier 2	1.00	0.20	115	0.36
San Rafael Road	Rough Terrain Forklifts	Diesel	Tier 4 Interim	1.00	2.80	114	0.40
San Rafael Road	Signal Boards	Diesel	Average	1.00	8.20	6.00	0.82
San Rafael Road	Sweepers/Scrubbers	Diesel	Average	1.00	1.10	74.0	0.46
Beach Road	Air Compressors	Diesel	Average	1.00	0.24	37.0	0.48
Beach Road	Other Construction Equipment	Diesel	Tier 4 Interim	1.00	0.24	305	0.42
Beach Road	Cranes	Diesel	Tier 2	1.00	0.30	270	0.29
Beach Road	Paving Equipment	Diesel	Tier 2	1.00	0.12	115	0.36
Beach Road	Rollers	Diesel	Average	1.00	0.60	320	0.38
Beach Road	Rough Terrain Forklifts	Diesel	Tier 4 Interim	1.00	2.00	114	0.40
Beach Road	Signal Boards	Diesel	Average	1.00	7.30	6.00	0.82
Beach Road	Sweepers/Scrubbers	Diesel	Average	1.00	0.91	36.0	0.46
San Rafael Road	Other Construction Equipment	Diesel	Average	1.00	1.00	82.0	0.42
Beach Road	Other Construction Equipment	Diesel	Average	1.00	1.40	82.0	0.42

San Rafael Road	Rollers	Diesel	Average	1.00	0.70	80.0	0.38

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
San Rafael Road	—	—	—	—
San Rafael Road	Worker	11.0	34.8	LDA,LDT1,LDT2
San Rafael Road	Vendor	1.00	7.30	HHDT,MHDT
San Rafael Road	Hauling	2.00	38.3	HHDT
San Rafael Road	Onsite truck	—	—	HHDT
Beach Road	—	—	—	—
Beach Road	Worker	8.00	34.7	LDA,LDT1,LDT2
Beach Road	Vendor	1.00	7.30	HHDT,MHDT
Beach Road	Hauling	1.00	48.8	HHDT
Beach Road	Onsite truck	—	—	HHDT

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Construction duration provided by the applicant.
Construction: Off-Road Equipment	Construction equipment information provided by the applicant. CalEEMod default values were used when project-specific equipment or emission factor data were not available. Assumed diesel engine when fuel type was not provided to be conservative.
Construction: Dust From Material Movement	Haul trips provided by the applicant and included in "Trips and VMT" tab.
Construction: Trips and VMT	Construction vehicle trip activity information provided by the applicant.

Construction Off-Road Equipment Activity (Total Hours per Month)

Equipment Type	CalEEMod Equipment Type	Fuel Type	Horsepower	Tier Engine	San Rafael Avenue						Beach Road							
					Feb	Mar	Apr	May	Duration (day)	Hour per day	May	Jun	July	Aug	Sep	Oct	Duration (day)	Hour per day
Air Compressors	Air Compressors	Diesel			32					0.37	32							0.24
Compactor	Other Construction Equipment	Diesel	305	Tier 4				32		0.37					32			0.24
Cranes	Cranes	Diesel	270	Tier 2			40			0.47				40				0.30
Excavator/Breaker for Demo/Clear & Grub	Excavators			Tier 4	48					0.56		48						0.36
Excavators - Demo/Dirt Exc	Excavators	Diesel	275	Tier 4	48					0.56		48						0.36
Excavators for Sheet Pile Installation	Bore/Drill Rigs	Diesel	354	Tier 4	120	120				2.8	160	160						2.4
Pavers	Pavers		320	Tier 4				86	86	1.0						74	132	0.56
Pavement Grinder	Paving Equipment	Diesel	115	Tier 2			16			0.2					16			0.12
Asphalt Rollers	Rollers		80					64		0.7				64	16			0.6
Rough Terrain Forklifts	Rough Terrain Forklifts		114	Tier 4	120	120				2.8			120	120				2
Rubber Tired Loaders	Rubber Tired Loaders		305	Tier 4	80	80	40			2.3	80	80	80	40	80	40		3.0
Signal Boards	Signal Boards		6		176	176	176	176		8.2	176	176	176	176	176	88		7.3
Sweepers/Scrubbers	Sweepers/Scrubbers		74		24	24	24	24		1.1	24	24	24	24	24			0.91
Pothole/Vac Truck	Other Construction Equipment				44					0.51	44							0.33
Concrete Ready-Mix Trucks	Other Construction Equipment							45		0.52	54				45	45		1.1

Note: CalEEMOd default values were used when project-specific data were not available. Assumed diesel engine when fuel type was not provided to be conservative.

Construction Vehicle Trip Activity (Total Trips per Month)

Truck Trip Activity	Travel Destination	One-way Travel Distance (miles)	Fleet Mix (percentage)				San Rafael Avenue							Beach Road						
			LDA	LHD	MHD	HHD	Jan	Feb	Mar	Apr	May	Trips/ day	Trip length	Jun	Jul	Aug	Sept	Oct	Trips/ day	Trip length
Worker Commute Trips	Work/Home	35	100%				132	220	220	154	154	10.23	35	154	220	220	220	154	7.33	35
Van	Employee Parking	3		100%			11	22	22	22	22	1.15	3	22	21	22	22	22	0.83	3
Concrete Trucks Trips	San Rafael	9.5				100%			15	18		0.38	9.5				15	15	0.23	9.5
Soil Haul Trips	Redwood Landfill	24				100%	42	58	46		56	2.35	24	42	42	58	60		1.53	24
Vendor Trips	Various Bay Area Locations	7.3			50%	50%	10	10	12	12	14	0.67	7.3	10	10	12	12	12	0.42	7.3
Sheet Pile Trips	Stockton	93				100%		11	10			0.24	93		16	15			0.23	93
Dutra Quarry	San Rafael	11				100				96		1.12	11					42	0.32	58
							Weighted Worker Commute Trips:					11	34.8	**Weighted Worker Commute Trips:**					8	34.7
												Vendor Trips:		1	7.30				**Vendor Trips:**		1	7.3
												Weighted Hauling Trips:		2	38.3				**Weighted Hauling Trips:**		1	48.8

Summary of ISCST3 Model Parameters, Assumptions, and Results for DPM and $PM_{2.5}$ Emissions during Construction along San Rafael Avenue

ISCST3 Model Parameters and Assumptions			
Source Type	**Units**	**Value**	**Notes**
Area Source: Off-Road Equipment Exhaust			
Average Hours/Work Day	hours/day	9.00	Monday to Friday: 8 am to 5 pm
DPM Emission Rate	gram/second	0.001027	Exhaust $PM_{2.5}$ from off-road equipment. Scaling factor used to convert result from ISCST3 (Assumed 1 gram/second emission rate in the ISCST3 model)
Source Area	square meters	2167.5	
Release Height	meters	5.0	
Initial Vertical Dimension	meters	1.4	
ISCST3 Model Results			
Sensitive Receptor	**Pollutant**	**Annual Average Concentration**	**Notes**
MEIR - San Rafael	DPM ($\mu g/m^3$)	0.1178	Nearest residential receptor
	$PM_{2.5}$ ($\mu g/m^3$)	0.1178	Nearest residential receptor

Notes:

DPM = diesel particulate matter

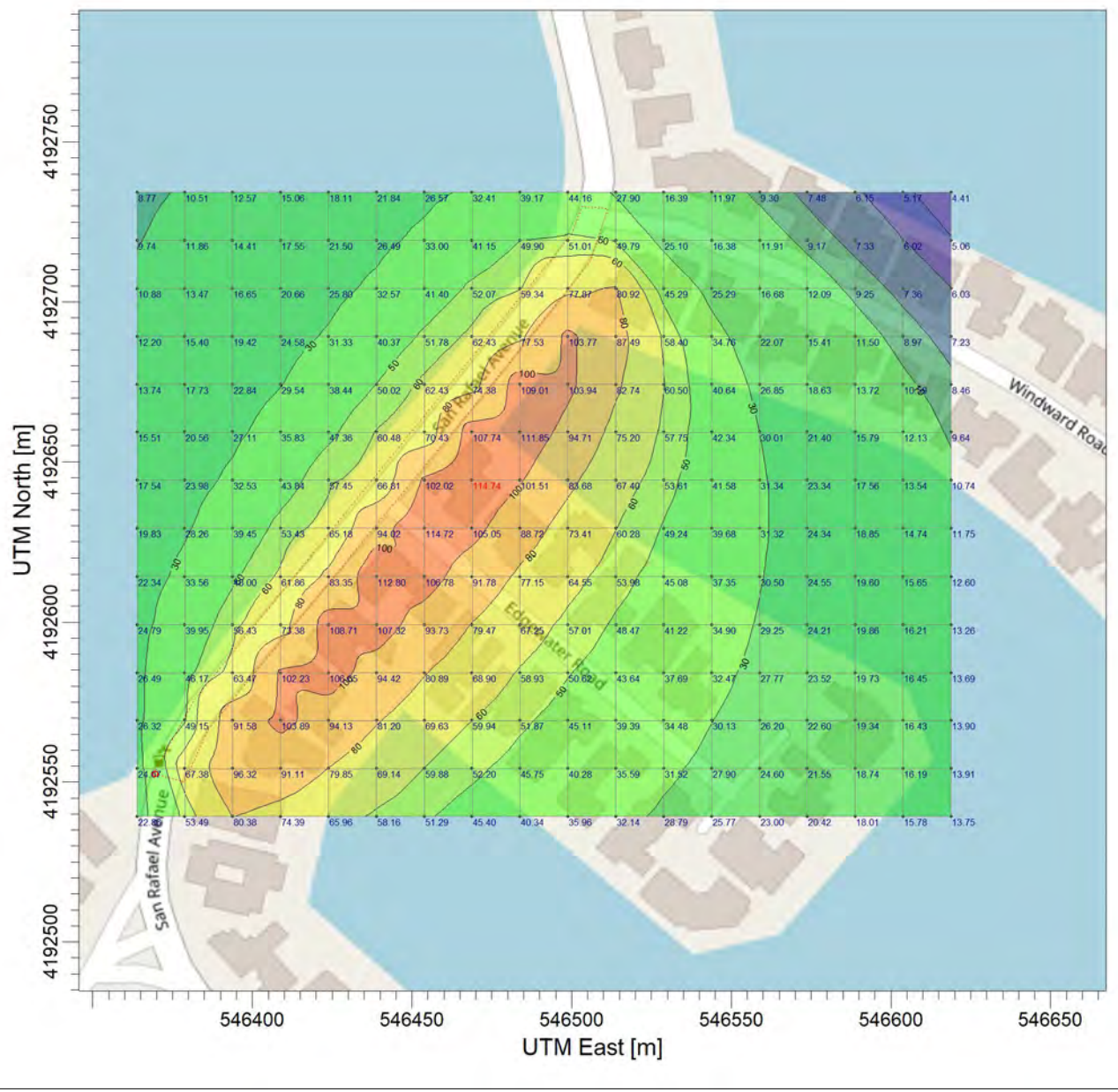
PM_{10} = particulate matter with aerodynamic resistance diameters equal to or less than 10 microns

$PM_{2.5}$ = particulate matter with aerodynamic resistance diameters equal to or less than 2.5 microns

$\mu g/m^3$ = micrograms per cubic meter

PROJECT TITLE: Beach Rd

BSUP Project - San Rafael Ave



COMMENTS:

San Rafael Ave Part

SOURCES:

1

RECEPTORS:

252

OUTPUT TYPE:

Concentration

MAX:

115 ug/m^3

COMPANY NAME:

MODELER:

DATE:

9/6/2022

SCALE: 1:2,087

0 0.05 km

PROJECT NO.:

Summary of Health Risk Assessment for DPM Emissions during Construction along San Rafael Avenue

Health Risk Assessment Parameters and Results			
Inhalation Cancer Risk Assessment for DPM	**Units**	**0-2 Year Infant**	**Notes**
DPM Concentration (C)	$\mu g/m^3$	0.118	ISCST3 Annual Average
Daily Breathing Rate (DBR)	L/kg-day	1090	95th percentile under age of 2 (OEHHA, 2015)
Inhalation absorption factor (A)	unitless	1.0	OEHHA, 2015
Exposure Frequency (EF)	unitless	0.96	350 days/365 days in a year (OEHHA, 2015)
Dose Conversion Factor (CF_D)	$mg\text{-}m^3/\mu g\text{-}L$	0.000001	Conversion of µg to mg and L to m^3
Dose (D)	mg/kg/day	0.000123	$C*DBR*A*EF*CF_D$ (OEHHA, 2015)
Cancer Potency Factor (CPF)	$(mg/kg/day)^{-1}$	1.1	OEHHA, 2015
Age Sensitivity Factor (ASF)	unitless	10	OEHHA, 2015
Annual Exposure Duration (ED)	years	0.50	Based on total construction period of 6 months[1]
Averaging Time (AT)	years	70	70 years for residents (OEHHA, 2015)
Fraction of time at home (FAH)	unitless	0.85	OEHHA, 2015
Cancer Risk Conversion Factor (CF)	m^3/L	1000000	Chances per million (OEHHA, 2015)
Cancer Risk at MEIR location	per million	8.2	D*CPF*ASF*ED/AT*FAH*CF (OEHHA, 2015)
Total Cancer Risk	per million	8.2	
Hazard Index for DPM	**Units**	**Notes**	
Chronic REL	$\mu g/m^3$	OEHHA, 2015	
Chronic Hazard Index for DPM	unitless	At MEIR location - San Rafael	

Notes:

DPM = diesel particulate matter

REL = reference exposure level

$\mu g/m^3$ = micrograms per cubic meter

L/kg-day = liters per kilogram-day

m^3/L = cubic meters per liter

$(mg/kg/day)^{-1}$ = 1/milligrams per kilograms per day

MEIR = maximum exposed individual resident

Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk

[1] The OEHHA guidance recommend that exposure from projects longer than 2 months but less than 6 months be assumed to last 6 months

Summary of ISCST3 Model Parameters, Assumptions, and Results for DPM and $PM_{2.5}$ Emissions during Construction along Beach Road

ISCST3 Model Parameters and Assumptions			
Source Type	**Units**	**Value**	**Notes**
Area Source: Off-Road Equipment Exhaust			
Average Hours/Work Day	hours/day	9.00	Monday to Friday: 8 am to 5 pm
DPM Emission Rate	gram/second	0.001077	Exhaust $PM_{2.5}$ from off-road equipment. Scaling factor used to convert result from ISCST3 (Assumed 1 gram/second emission rate in the ISCST3 model)
Source Area	square meters	2434.1	
Release Height	meters	5.0	
Initial Vertical Dimension	meters	1.4	
ISCST3 Model Results			
Sensitive Receptor	**Pollutant**	**Annual Average Concentration**	**Notes**
MEIR - Beach Road	DPM ($\mu g/m^3$)	0.0813	Nearest residential receptor
	$PM_{2.5}$ ($\mu g/m^3$)	0.0813	Nearest residential receptor

Notes:

DPM = diesel particulate matter

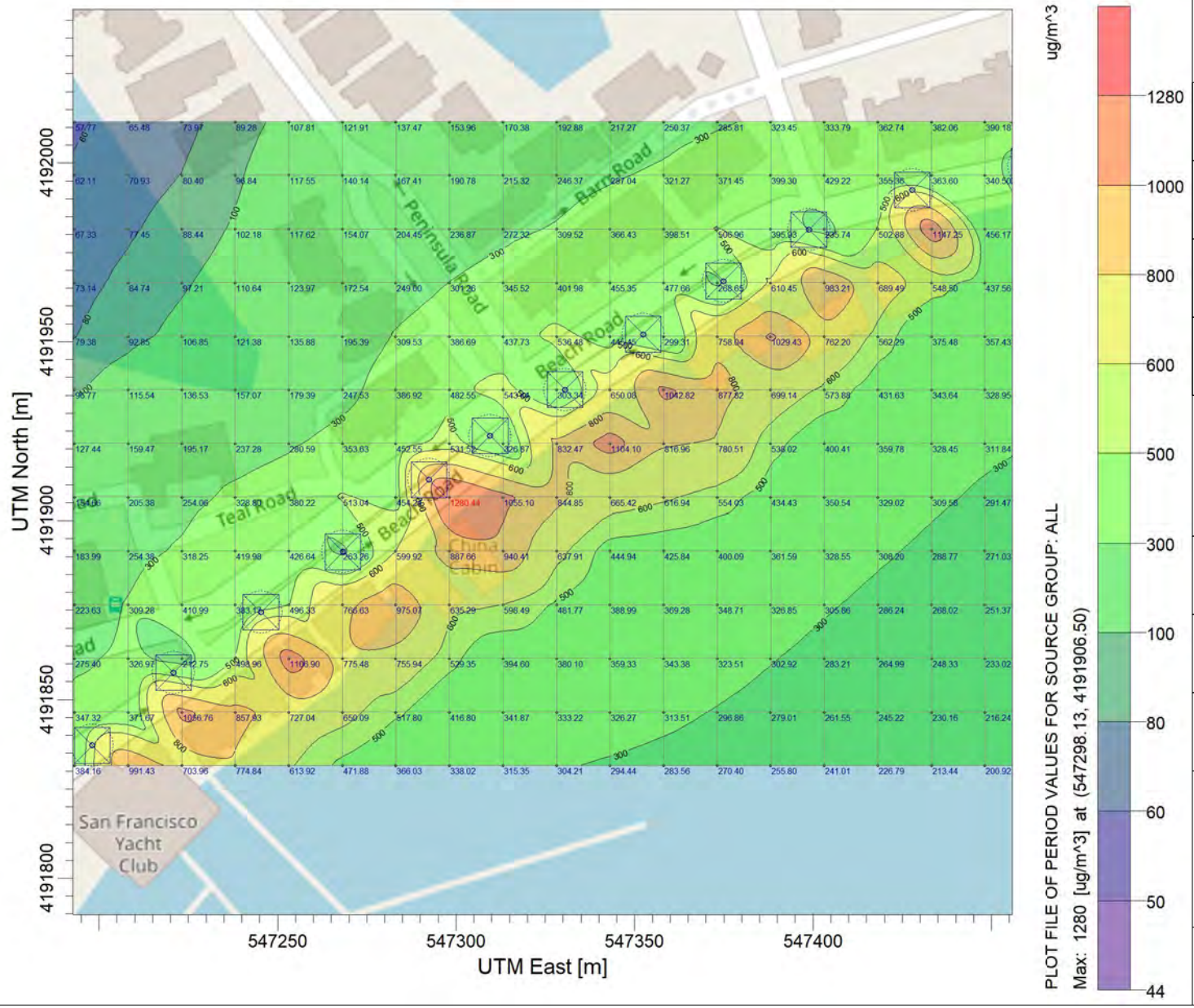
PM_{10} = particulate matter with aerodynamic resistance diameters equal to or less than 10 microns

$PM_{2.5}$ = particulate matter with aerodynamic resistance diameters equal to or less than 2.5 microns

$\mu g/m^3$ = micrograms per cubic meter

PROJECT TITLE: Beach Rd

BSUP Project - Beach Road



COMMENTS:

Beach Road Part

SOURCES:

13

RECEPTORS:

325

OUTPUT TYPE:

Concentration

MAX:

1280 ug/m^3

COMPANY NAME:

MODELER:

DATE:

9/5/2022

SCALE: 1:1,724

0 0.05 km

PROJECT NO.:

Summary of Health Risk Assessment for DPM Emissions during Construction along Beach Road

Health Risk Assessment Parameters and Results			
Inhalation Cancer Risk Assessment for DPM	**Units**	**0-2 Year Infant**	**Notes**
DPM Concentration (C)	$\mu g/m^3$	0.081	ISCST3 Annual Average
Daily Breathing Rate (DBR)	L/kg-day	1090	95th percentile under age of 2 (OEHHA, 2015)
Inhalation absorption factor (A)	unitless	1.0	OEHHA, 2015
Exposure Frequency (EF)	unitless	0.96	350 days/365 days in a year (OEHHA, 2015)
Dose Conversion Factor (CF_D)	$mg\text{-}m^3/\mu g\text{-}L$	0.000001	Conversion of µg to mg and L to m^3
Dose (D)	mg/kg/day	0.000085	$C*DBR*A*EF*CF_D$ (OEHHA, 2015)
Cancer Potency Factor (CPF)	$(mg/kg/day)^{-1}$	1.1	OEHHA, 2015
Age Sensitivity Factor (ASF)	unitless	10	OEHHA, 2015
Annual Exposure Duration (ED)	years	0.50	Based on total construction period of 6 months[1]
Averaging Time (AT)	years	70	70 years for residents (OEHHA, 2015)
Fraction of time at home (FAH)	unitless	0.85	OEHHA, 2015
Cancer Risk Conversion Factor (CF)	m^3/L	1000000	Chances per million (OEHHA, 2015)
Cancer Risk at MEIR location	per million	5.7	D*CPF*ASF*ED/AT*FAH*CF (OEHHA, 2015)
Total Cancer Risk	per million	5.7	
Hazard Index for DPM	**Units**	**Notes**	
Chronic REL	$\mu g/m^3$	OEHHA, 2015	
Chronic Hazard Index for DPM	unitless	At MEIR location - Beach Road	

Notes:

DPM = diesel particulate matter

REL = reference exposure level

$\mu g/m^3$ = micrograms per cubic meter

L/kg-day = liters per kilogram-day

m^3/L = cubic meters per liter

$(mg/kg/day)^{-1}$ = 1/milligrams per kilograms per day

MEIR = maximum exposed individual resident

Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk

[1] The OEHHA guidance recommend that exposure from projects longer than 2 months but less than 6 months be assumed to last 6 months

Existing Stationary Source within 1,000 feet:

Plant#	Plant Name	Address	City	St	Zip	County	UTM_E (km)	UTM_N (km)	Cancer Risk	Hazard Index	PM2.5	Type
23998	Sanitary District #5 of Marin County	Cove, Rd Pump Station	Tiburon	CA	94920	Marin	547370	4192029	1.04E-03	7.11E-06	3.45E-05	(1) Nat. Gas Generator
								Distance to MEIR (feet):	920			Risk and hazard impacts adjusted using the BAAQMD generic Distance Multiplier Tool.
								Health risks at Beach Road MEIR:	1.57E-04	1.07E-06	5.18E-06	

Source: BAAQMD's 2018 stationary source emissions data

BAAQMD's Generic Distance Multiplier Tool: This distance multiplier tool refines the screening values to represent adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions.

Generic Case		
Distance (meters)	Distance (feet)	Multiplier
0	0.0	1.000
5	16.4	1.000
10	32.8	0.883
15	49.2	0.855
20	65.6	0.827
25	82.0	0.801
30	98.4	0.775
35	114.8	0.750
40	131.2	0.726
45	147.6	0.702
50	164.0	0.679
55	180.4	0.658
60	196.9	0.636
65	213.3	0.616
70	229.7	0.596
75	246.1	0.577
80	262.5	0.558
85	278.9	0.540
90	295.3	0.523
95	311.7	0.506
100	328.1	0.489
105	344.5	0.474
110	360.9	0.458
115	377.3	0.444
120	393.7	0.429
125	410.1	0.415
130	426.5	0.402
135	442.9	0.389
140	459.3	0.376
145	475.7	0.364
150	492.1	0.353
155	508.5	0.341
160	524.9	0.330
165	541.3	0.319
170	557.7	0.309
175	574.1	0.299
180	590.6	0.290
185	607.0	0.280
190	623.4	0.271
195	639.8	0.262
200	656.2	0.254
205	672.6	0.246
210	689.0	0.238
215	705.4	0.230
220	721.8	0.223
225	738.2	0.216
230	754.6	0.209
235	771.0	0.202
240	787.4	0.195
245	803.8	0.189
250	820.2	0.183
255	836.6	0.177
260	853.0	0.171
265	869.4	0.166
270	885.8	0.160
275	902.2	0.155
280	918.6	0.150
285	935.0	0.145
290	951.4	0.141
295	967.8	0.136
300	984.3	0.132

APPENDIX C
CONSTRUCTION MANAGEMENT PLAN

CONSTRUCTION MANAGEMENT PLAN

BELVEDERE CRITICAL INFRASTRUCTURE PROJECT – PHASE 1 SHEETPILE PROJECT

Prepared by B.K. Cooper

September 27, 2022

Construction Sequencing

- The overall schedule plan for the infrastructure project is based on an 8-month duration.
- Construction will begin on San Rafael Avenue.
    - Substantial completion for work along San Rafael Ave is expected to be 4 months.
- Construction on Beach Road will proceed after the substantial completion of San Rafael Avenue.
    - Substantial completion for work along Beach Road is expected to be 5 months.
    - The first (1) month of work on Beach Road will occur simultaneously with the last month of work on San Rafael Ave.
    - The in-water installation of sheet piling on Beach Road expected to be restricted to July 1- October 30.
- On both sites, traffic control will divide the roadway.
- One side of the roadway will be used for construction while one lane will be for traffic.
- The portion closed for construction will only be closed for an appropriate distance on either end of the construction work face.
- The traffic lane will be controlled by traffic control persons, signage, and traffic control devices.
- Weekends and nights might require solar powered traffic signals.
- The Stormwater Pollution Prevention Plan (SWPPP) plan will be implemented in coordination with establishing the laydown /staging areas.
- The construction schedule will reflect an “evolution approach.”

San Rafael’s evolution will include:

- Clear and grub
- Concrete, asphalt and path demo
- Temporary relocation of rip rap, if necessary
- Starter trench excavation for the sheet piling
- Installation of the sheet piling
- Sheet piling will be installed on the Bay side of San Rafael Ave near the existing curb and existing bike path.
    - There will also be a section of sheet piling installed in Belvedere Lagoon between Windward Rd and Edgewater Rd.
- The installation of sheet piling along San Rafael Ave will be initiated by a vibratory hammer.
    - If the piling reaches refusal prior to achieving the required depth, an impact hammer will be utilized.
- Sheet piling installed on the lagoon will utilize a large crane with a vibratory hammer reaching from the street that will protect the BLPOA facilities.
- Form and pour concrete cap on sheet piling

- Backfill excavation
- Replace rip rap, if necessary
- Install landscape and irrigation
- Install curb, gutters, etc.
- Repave San Rafael Ave where needed

Beach Road evolution will include:

- Clear and Grub
- Concrete and asphalt demo
- Starter trench excavation for the sheet piling
- Installation of the sheet piling
- Sheet piling on Beach Rd will be initiated by a vibratory hammer.
    - If the piling reaches refusal prior to achieving the required depth, an impact hammer will be utilized.
- Beach Rd sheet pile installation will require temporary relocation of bayside property service utilities.
    - There could be utility service interruptions from 4-8 hours prior to reconnection.
    - Following installation of the sheet piles, permanent service connections will be re-established.
- Form and pour concrete cap on sheet piling where applicable
- Backfill excavation
- Replace walkways
- Replace curb, gutters, etc.
- Repave Beach Rd where necessary

Construction Hauling and Transportation

Inbound transportation of materials will travel east on Tiburon Blvd from Highway 101, turn right onto San Rafael Ave, left onto Beach Road, left on to Tiburon Blvd and back to Highway 101.

Outbound transportation of discarded materials shall travel in the same pattern as inbound transportation.

Contractor and sub-contractor employees shall park their personal vehicles outside the City of Belvedere and be transported to and from the construction area via Contractor supplied vans or buses. The contractor shall determine the location of the employee parking area.

Steel Sheet Pile Installation Method

Steel sheet piling may be installed using a vibratory hammer. The vibratory hammer would be attached to a crane, an excavator, or an ABI type machine. Some pile drivers utilize a smaller hydraulic truck crane

to “loft” (place the next pair of sheets into the previously driven sheet piles interlock) the sheet piles and a second machine drives the piles down.

Additional Sheet Pile Installation Method Definitions:

The silent driver is a specialized sheet pile installer that utilizes hydraulic pressure. This process minimizes vibrations, although they require 2-3 pairs of sheets to be installed with a standard vibratory hammer to get the silent driver started. If there is ample room, the silent driver may utilize a 25”x15’ “rack” in-lieu of starting with a vibratory hammer to begin the sheet pile run.

If the sheet piling reaches a point of refusal (they are not getting to the required tip depth) a pile contractor may utilize an impact hammer or they may pre-drill future pile locations. There are two pre-drill methods: auger in the drill bit and auger in reverse not removing soil or lifting the drill bit while continually drilling, thus removing the soils.

A vibratory hammer uses spinning counterweights to create a vibration, which causes a sheet pile to” cut” into the soil below. An impact hammer works like a hammer and a nail (a weight or ram strikes the pile and drives/forces the sheet pile into the ground) where a vibratory hammer works more like an electric knife cutting through meat (the high-speed vibration causes the soil to give away, allowing the pile to slip into the ground). As mentioned above, the impact hammer would only be used to advance the piles to tip. Tip refers to the required depth that that has been designed by the geotechnical engineer. There are several alternatives to using an impact hammer to advance the piles to tip.

As mentioned above, drilling can loosen the soil allowing the sheet pile to reach tip. If the installer unwinds the drill tool instead of lifting out the soil, the soil remains loosened but not removed. One can envision a corkscrew in a bottle of wine…instead of pulling the cork out with the embedded screw, just unscrew the cork and cork will remain in the bottle.

A vibratory hammer uses a clamp, which is attached to the bottom of the hammer. The clamp grabs and holds on to the sheet pile. This allows the installer to both vibrate the pile in or it allows the installer to pull the pile up in-order to keep the pile plumb. When installing a sheet pile wall, it is imperative to keep the piling plumb, so the sheet piles properly interlock with each other. An impact hammer can only drive down and cannot pull back up to plumb the sheet piles.

The silent driver is a vibration-free hydraulic machine utilizing the press-in method. This sheet pile installation machine operates on top of sheet piles and presses in the sheets. It is basically a giant hydraulic jack. In-order for the silent driver to begin installing a sheet pile wall, either 3 pair of sheets (as reactionary piles) must be installed with a separate crane or excavator using a vibratory hammer or the silent driver can start the sheet pile wall using a reactionary stand. The reactionary stand needs at least a clear, flat, and firm area 25 ft. x 15 ft.

APPENDIX D
PUBLIC COMMENTS MADE AT SCOPING MEETING OF FEBRUARY 9, 2022

Summary of February 9, 2022, Seismic Upgrade Project EIR Comments

Prepared by A. Skewes-Cox

Rothman: Water from Tiburon could be stuck behind wall and worsen Lagoon flooding; conflict of interest with Stetson doing hydrology analysis since they're doing engineering design.

Stoehr: Lagoon resident; house next door used backhoe and house shook with broken slabs and vibration from sheet piling; what about settlement in areas of San Rafael Avenue where no sheet piling; should there be more sheet piling; concerned about noise.

Byruck: Belvedere Land Company; Alternatives to address flood barrier and access impacts; what is permitting timing; aesthetics; land use; parking; ADA requirements on Beach Road; parking loss; analysis by BLC that City has; historic resources; range of heights of floodwall; alternative of removing sheet piling vs. floodwall.

Du Molin: flooding benefits vs. utility protection (earthquake); need to know costs of each and to consider these issues separately.

APPENDIX E
NOISE DATA

Construction Noise Calculations - San Rafael Avenue

Construction Phase	Equipment[1]	No. Equipment[1]	Usage Factor[2]	Maximum Noise Level @ 50 feet (Lmax)[2,3]	Typical Noise Level @ 50 feet (dBA_1)	Reference Distance (D_1)	Distance to Receptor (D_2)	Ground Absorption Constant (G)	Noise Level at Receptor (dBA_2)	Two Noisiest Equipment at Receptor	Buffer Distance to 90 dBA Threshold
Unit			%	dBA Lmax	dBA Leq	feet	feet	unitless	dBA Leq	dBA Leq	feet
Demolition	Excavator	2	40	85	81	50	23	0	88	91	25
	Loader	1	40	80	76	50	23	0	83		
	Air Compressor	1	40	80	76	50	23	0	83		
Excavation	Excavator	2	40	85	81	50	23	0	88	91	25
	Loader	1	40	80	76	50	23	0	83		
	Vacuum Excavator (Vac-Truck)	1	40	85	81	50	23	0	88		
	Air Compressor	1	40	80	76	50	23	0	83		
Sheet piling (impact)	Pile-driver (Impact)	1	20	101	94	50	18	0	103	103	81
	Excavator	1	40	85	81	50	18	0	90		
Sheet piling (vibratory)	Pile-driver (Sonic)	1	20	95	88	50	18	0	97	98	44
	Excavator	1	40	85	81	50	18	0	90		
	Crane	1	16	88	80	50	18	0	89		
Cap and Backfill	Concrete Mixer Truck	1	40	85	81	50	23	0	88	89	20
	Compactor	1	20	82	75	50	23	0	82		
	Loader	1	40	80	76	50	23	0	83		
Paving	Paver	1	50	85	82	50	23	0	89	90	24
	Roller	1	20	85	78	50	23	0	85		

Notes:

Noise level at the receptor calculated based on the following equation:[4]

$dBA_2 = dBA_1 + 10 * \log_{10}(D_1/D_2)^{2+G}$

Where:

dBA_2 = Noise level at receptor

dBA_1 = Noise level at reference distance

D_1 = Reference distance

D_2 = Receptor distance

G = Ground absorption constant (0 for hard surface, 0.5 for soft surface)

Combined noise levels at receptor calculated for two noisiest equipment using decibel addition:

$L = 10 * \log_{10}(10^{(L_1/10)}+10^{(L_2/10)})$

L = Combined noise level

L_1 = Noise level for first noisiest piece of equipment

L_2 = Noise level for second noisiest piece of equipment

Buffer distance to noise threshold calculated based on the following equation:

$D_2 = D_1/(10^{((dBA2- dBA1)/10*(2+G))})$

Where:

dBA_1 = Noise level at reference distance

dBA_2 = Noise threshold for construction

D_1 = Reference distance

D_2 = Buffer distance to construction noise threshold

G = Ground absorption constant (0 for hard surface, 0.5 for soft surface)

[1] The type of construction equipment is based on construction equipment list provided by the applicant.

[2] U.S. Department of Transportation, 2006. FHWA Highway Construction Noise Handbook, Table 9.1. August.

[3] Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual, Table 7-1. September.

[4] California Department of Transportation, 1998. Technical Noise Supplement (TeNS). Equation N-2141.2. October.

Construction Noise Calculations - Beach Road

Construction Phase	Equipment[1]	No. Equipment[1]	Usage Factor[2]	Maximum Noise Level @ 50 feet (Lmax)[2,3]	Typical Noise Level @ 50 feet (dBA_1)	Reference Distance (D_1)	Distance to Receptor (D_2)	Ground Absorption Constant (G)	Noise Level at Receptor (dBA_2)	Two Noisiest Equipment at Receptor	Buffer Distance to 90 dBA Threshold
Unit			**%**	**dBA Lmax**	**dBA Leq**	**feet**	**feet**	**unitless**	**dBA Leq**	**dBA Leq**	**feet**
Demolition	Excavator	2	40	85	81	50	10	0	95	98	25
	Loader	1	40	80	76	50	10	0	90		
	Air Compressor	1	40	80	76	50	10	0	90		
Excavation	Excavator	2	40	85	81	50	10	0	95	98	25
	Loader	1	40	80	76	50	10	0	90		
	Vacuum Excavator (Vac-Truck)	1	40	85	81	50	10	0	95		
	Air Compressor	1	40	80	76	50	10	0	90		
Sheet piling (impact)	Pile-driver (Impact)	1	20	101	94	50	10	0	108	108	81
	Excavator	1	40	85	81	50	10	0	95		
Sheet piling (vibratory)	Pile-driver (Sonic)	1	20	95	88	50	10	0	102	103	44
	Excavator	1	40	85	81	50	10	0	95		
	Crane	1	16	88	80	50	10	0	94		
Cap and Backfill	Concrete Mixer Truck	1	40	85	81	50	10	0	95	96	20
	Compactor	1	20	82	75	50	10	0	89		
	Loader	1	40	80	76	50	10	0	90		
Paving	Paver	1	50	85	82	50	10	0	96	97	24
	Roller	1	20	85	78	50	10	0	92		

Notes:

Noise level at the receptor calculated based on the following equation:[4]

$dBA_2 = dBA_1 + 10 * \log_{10}(D_1/D_2)^{2+G}$

Where:

dBA_2 = Noise level at receptor

dBA_1 = Noise level at reference distance

D_1 = Reference distance

D_2 = Receptor distance

G = Ground absorption constant (0 for hard surface, 0.5 for soft surface)

Combined noise levels at receptor calculated for two noisiest equipment using decibel addition:

$L = 10 * \log_{10}(10^{(L_1/10)}+10^{(L_2/10)})$

L = Combined noise level

L_1 = Noise level for first noisiest piece of equipment

L_2 = Noise level for second noisiest piece of equipment

Buffer distance to noise threshold of 90 dBA calculated based on the following equation:

$D_2 = D_1/(10^{((dBA2- dBA1)/10*(2+G))})$

Where:

dBA_1 = Noise level at reference level

dBA_2 = Noise threshold for construction

D_1 = Reference distance

D_2 = Buffer distance to construction noise threshold

G = Ground absorption constant (0 for hard surface, 0.5 for soft surface)

[1] The type of construction equipment is based on construction equipment list provided by the applicant.

[2] U.S. Department of Transportation, 2006. FHWA Highway Construction Noise Handbook, Table 9.1. August.

[3] Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual, Table 7-1. September.

[4] California Department of Transportation, 1998. Technical Noise Supplement (TeNS). Equation N-2141.2. October.

Construction Vibration Calculations for Potential Building Damage

Equipment	Typical Vibration Level @ 25 Feet[1] (PPV_1)	Reference Distance (D_1)	Residential/Commercial Buildings		Historical Buildings	
			Building Damage Vibration Threshold (PPV_2)	Buffer Distance to Damage Threshold (D_2)	Building Damage Vibration Threshold (PPV_3)	Buffer Distance to Damage Threshold (D_3)
Unit	**in/sec**	**feet**	**in/sec**	**feet**	**in/sec**	**feet**
Pile Driver (impact) typical	0.644	25	0.3	45	0.25	52
Pile Driver (sonic) typical	0.170	25	0.3	16	0.25	19
Vibratory Roller	0.210	25	0.3	19	0.25	22
Loaded trucks	0.076	25	0.3	9	0.25	10

Notes:

Buffer distance to vibration threshold for building damage calculated based on the following equation:[2]

$D_2 = (PPV_1 / PPV_2)^{(1 / 1.3)} * D_1$

Where:

PPV_1 = Vibration level at reference distance

PPV_2 = Vibration threshold for building damage

D_1 = Reference distance

D_2 = Buffer distance to vibration threshold for building damage

Construction Vibration Calculations for Potential Annoyance

Equipment	Typical Vibration Level @ 25 Feet[1] (RMS_1)	Reference Distance (D_1)	Residential Land Use		Institutional Land Use	
			Annoyance Vibration Threshold (RMS_2)	Buffer Distance to Annoyance Threshold (D_2)	Annoyance Vibration Threshold (RMS_2)	Buffer Distance to Annoyance Threshold (D_2)
Unit	**VdB**	**feet**	**VdB**	**feet**	**VdB**	**feet**
Pile Driver (impact) typical	104	25	80	158	83	125
Pile Driver (sonic) typical	93	25	80	68	83	54
Vibratory Roller	94	25	80	73	83	58
Loaded trucks	86	25	80	40	83	31

Notes:

Buffer distance to vibration threshold for human annoyance calculated based on the following equation:[2]

$D_2 = D_1 * 10^{((RMS_1 - RMS_2) / 30)}$

Where:

RMS_1 = Vibration level at reference distance

RMS_2 = Vibration threshold for human annoyance

D_1 = Reference distance

D_2 = Buffer distance to vibration threshold for human annoyance

[1] Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual, Table 7-4. September.

[2] Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual, Equations 7-2 and 7-3. September.

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

Construction truck trips (3 trips per day)

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	0.0	
Average automobile speed (mph):		0.0
Medium truck volume (v/h):	0.0	
Average medium truck speed (mph):		0.0
Heavy truck volume (v/h):	1.0	
Average heavy truck speed (mph):		30.0
Bus volume (v/h):	0.0	
Average bus speed (mph):	0.0	
Motorcycle volume (v/h):	0.0	
Average Motorcycle speed (mph):		0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	45.9