Initial Study and Mitigated Negative Declaration

PIPS Parallel Force Main Project

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TABLE OF CONTENTS

Figures

Tables

Appendices

APPENDIX A:	**CALEEMOD OUTPUT**
APPENDIX B:	**AQUATIC RESOURCES DELINEATION**
APPENDIX C:	**BIOLOGICAL RESOURCES REPORT**

Acronyms

Acronym	Definition
AFY	Acre-feet per year
BMPs	Best management practices
BCDC	Bay Conservation and Development Commission
City	City of Petaluma
BAAQMD	Bay Area Air Quality Management District
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
CPSP	Central Petaluma Specific Plan
DWR	Department of Water Resources
ECWRF	Ellis Creek Water Recycling Facility
EIR	Environmental Impact Report
FEMA	Federal Emergency Management Agency
FIGR	Federated Indians of Graton Rancheria
FIRM	Flood Insurance Rate Map
GSP	Groundwater Sustainability Plan
hp	horsepower
IS	Initial Study
IS/MND	Initial Study/Mitigated Negative Declaration
MGD	Million gallons per day
MND	Mitigated Negative Declaration
MMRP	Mitigation Monitoring and Reporting Program
MS4	Municipal Separate Storm Sewer System
MTBM	microtunneling machine
NAHC	Native American Heritage Commission
ND	Negative Declaration
NPDES	National Pollutant Discharge Elimination System
NWIC	Northwest Information Center

Acronym	Definition
OSHA	Occupational Safety and Health Administration
PIPS	Primary Influent Pump Station
PG&E	Pacific Gas & Electric
PPV	Peak particle velocity
PRC	Public Resources Code
PTGAB	Pilot-tube guided auger boring
PVGSA	Petaluma Valley Groundwater Sustainability Agency
SCH	State Clearinghouse
SCWA	Sonoma County Water Agency
SGMA	Sustainable Groundwater Management Act
SMART	Sonoma-Marin Area Rail Transit
SWPPP	Stormwater Pollution Prevention Plan
VdB	Vibration Decibels

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1. INTRODUCTION

1.1 Purpose of this Document

The City of Petaluma (City) has prepared this Initial Study (IS) to evaluate the potential environmental impacts related to implementation of the Primary Influent Pump Station (PIPS) Parallel Force Main Project (the "proposed project", "project"), which consists of construction and operation of a new sewer force main pipeline, parallel to an existing 2.5-mile sewer force main from the PIPS to its termination at the Ellis Creek Water Recycling Facility (ECWRF) in the City of Petaluma, Sonoma County, California. The proposed project also includes construction and operation of a multi-use pedestrian and bicycle pathway between Marina Avenue and Casa Grande Road.

The City is the lead agency under the California Environmental Quality Act (CEQA) for the proposed project. CEQA requires that the lead agency prepare an IS to determine whether an Environmental Impact Report (EIR), Negative Declaration (ND), or Mitigated Negative Declaration (MND) is needed[1]. The City has prepared this IS to evaluate the potential environmental consequences associated with the project, and to disclose to the public and decision makers the potential environmental effects of the proposed project. Based on the analysis presented herein, an MND is the appropriate level of environmental documentation for the proposed project.

1.2 Document Background

The environmental effects of the proposed 2,100-foot multi-use pathway segment between Marina Avenue and Casa Grande Road were evaluated in the City of Petaluma General Plan 2025 EIR. The General Plan 2025 EIR was certified by the City in May 2008 under State Clearinghouse (SCH) Number 2004082065. This document makes reference to the analysis, findings, and mitigation measures related to the information contained in the General Plan 2025 EIR that are relevant to the proposed pathway.

1.3 Scope of this Document

This IS/MND has been prepared in accordance with CEQA (as amended) (Public Resources Code Section 21000 et. seq.) and the State CEQA Guidelines (California Code of Regulations, Title 14, Chapter 3, Section 15000 et. seq.), as updated on December 28, 2018. CEQA Guidelines Section 15063 describes the requirements for an IS and Sections 15070–15075 describe the process for the preparation of an MND. Where appropriate, this document refers to either the CEQA Statute or State CEQA Guidelines (as amended in December 2018). This IS/MND contains all the contents required by CEQA, which includes a project description, a description of the environmental setting, potential environmental impacts, mitigation measures for any significant effects, evaluation of consistency with plans and policies, and names of preparers.

This IS/MND evaluates the potential for environmental impacts to resource areas identified in Appendix G of the State CEQA Guidelines (as amended in December 2018). The environmental resource areas analyzed in this document include:

[1] An Initial Study need not be prepared if an Environmental Impact Report is clearly required, which is not the case in this instance.

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

1.4 CEQA Process

In accordance with CEQA Guidelines Section 15073, this Draft IS/MND will be circulated for a 30-day public review period (October 18, 2024 – November 18, 2024) to local and state agencies, and to interested organizations and individuals who may wish to review and comment on the report. The City will circulate the Draft IS/MND to the State Clearinghouse for distribution to State agencies. In addition, the City will circulate a Notice of Intent to Adopt a Mitigated Negative Declaration to the Sonoma County Clerk, responsible agencies, and interested entities. A copy of the Draft IS/MND is available for review at: https://cityofpetaluma.org/pipsforcemain.

Written comments can be submitted to the City of Petaluma by 5:00 pm on November 18, 2024, and addressed to:

Kristin Arnold
karnold@cityofpetaluma.org

Following the 30-day public review period, the City will evaluate all comments received on the Draft IS/MND and evaluate any substantial evidence that the proposed project could have an impact on the environment in the Final IS/MND and prepare a Mitigation Monitoring and Reporting Program (MMRP).

The IS/MND and MMRP will be considered for adoption by the City Council in compliance with CEQA at a future publicly noticed hearing; City Council meetings are held on the 1st and 3rd Monday of every month at 6:30 pm in City Hall located at 11 English Street, Petaluma, 94952.

1.5 Impact Terminology

The level of significance for each resource area uses CEQA terminology as specified below:

No Impact. No adverse environmental consequences have been identified for the resource or the consequences are negligible or undetectable.

Less than Significant Impact. Potential adverse environmental consequences have been identified. However, they are not adverse enough to meet the significance threshold criteria for that resource. No mitigation measures are required.

Less than Significant with Mitigation Incorporated. Adverse environmental consequences that have the potential to be significant have been identified but can be reduced to less than significant levels through the application of identified mitigation strategies that have not already been incorporated into the proposed project.

Potentially Significant. Adverse environmental consequences have been identified that have the potential to be significant according to the threshold criteria identified for the resource, even after mitigation strategies are applied and/or an adverse effect that could be significant and for which no mitigation has been identified. If any potentially significant impacts are identified, an EIR must be prepared to meet the requirements of CEQA.

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2. PROJECT DESCRIPTION

2.1 Project Overview

The Primary Influent Pump Station (PIPS) Parallel Force Main project ("project", "proposed project") would include construction of an approximately 13,000-foot-long new force main that would approximately follow the 12,900-foot-long alignment of the existing City force main from the City's PIPS facility to its termination at the ECWRF. The proposed parallel force main would deviate from the existing force main alignment for approximately 1,000 linear feet to avoid construction across the Azure Apartment Homes. The proposed parallel force main would bypass this property by constructing along Casa Grande Road and Technology Lane.

The proposed project also includes construction and operation of a multi-use pedestrian and bicycle pathway between Marina Avenue and Casa Grande Road. Please refer to *Section 2.4 Proposed Project Description* for a detailed description of the project components.

2.2 Project Purpose

The proposed project would create redundancy for the existing PIPS force main. The PIPS collects nearly all of the City's sewage flow and pumps it through a single 36-inch diameter force main to the ECWRF. Currently, without redundancy or alternative conveyance options, taking the existing force main offline for maintenance or any other reason is expensive and labor intensive. The PIPS parallel force main would create redundancy in sewer service in the event the existing PIPS force main must be taken offline.

The proposed multi-use pathway is a planned component of the City of Petaluma Bicycle and Pedestrian Plan (City of Petaluma, 2008). The purpose of the Bicycle and Pedestrian Plan is to make Petaluma a pedestrian- and bicycle-friendly community by means of complete streets, infrastructure improvements, and transportation planning for the benefit to all.

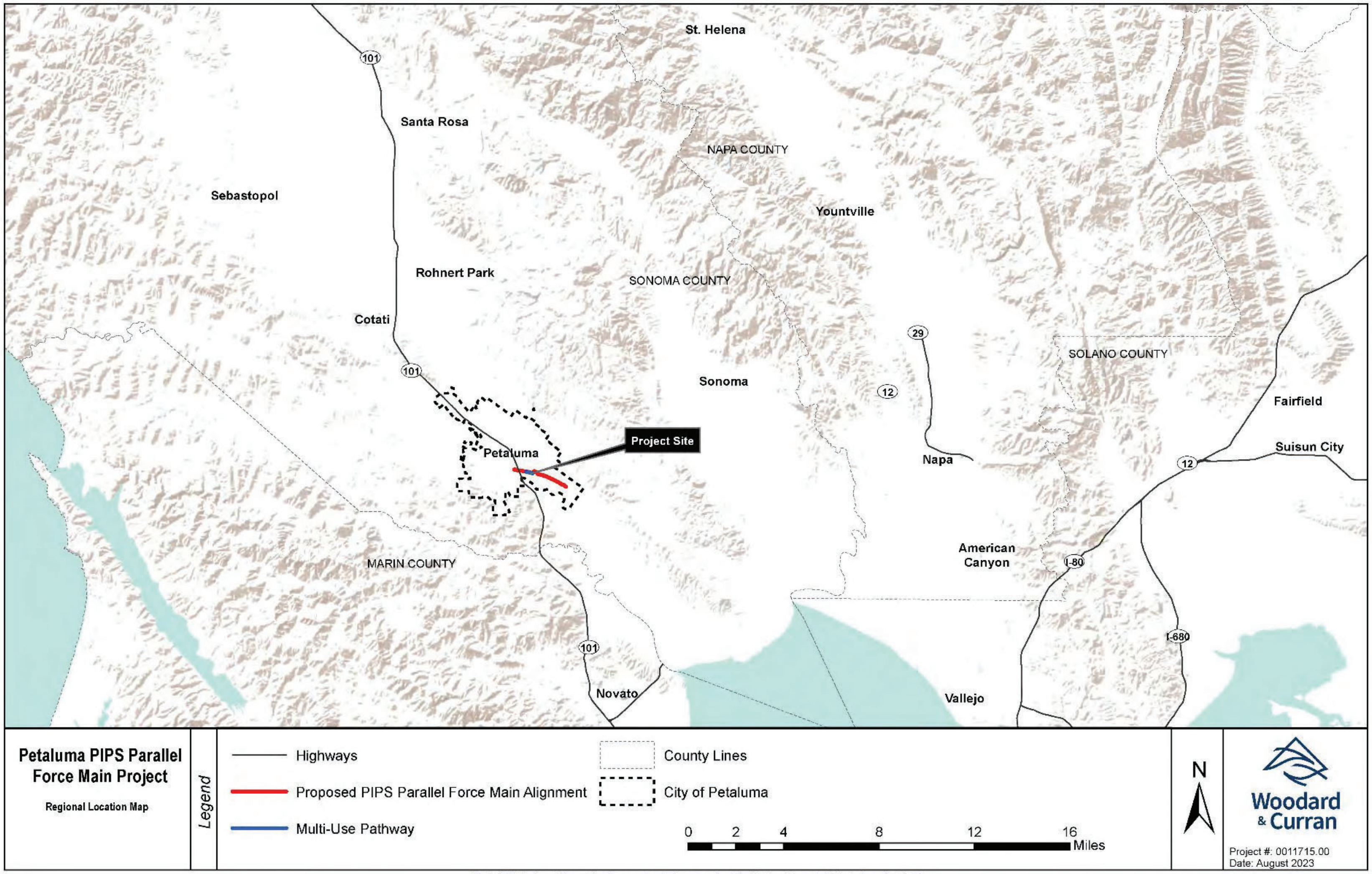
2.3 Project Location

The proposed project is located in the City of Petaluma, Sonoma County, California (see **Figure 2-1**). As shown in **Figure 2-2**, the proposed parallel force main would be located between the PIPS and the ECWRF. The proposed multi-use pathway would be located between Marina Avenue and Casa Grande Road.

2.3.1 Environmental Setting

At the time of construction of the existing force main in the 1970s, the land along the existing force main alignment was primarily vacant farmland. During the past 40 years, the farmland has been converted and developed for residential, commercial, and industrial use. The existing force main is now primarily located under streets, parking lots, and, in some cases, very close to buildings. The existing force main begins at the PIPS and heads east through vacant, privately owned land planned for development with townhomes (Tripoint Homes 2023; City of Petaluma 2023), crosses underneath a California Highway 101 overhead viaduct and Sonoma-Marin Area Rail Transit (SMART) railroad tracks, continues east in a relatively straight alignment through privately owned and developed commercial, residential, and industrial land, and continues straight through City-owned property until its termination at the ECWRF. Utilities in the vicinity of the proposed project include Comcast, Pacific Bell, Pacific Gas & Electric Company (PG&E), Sonic Telecom, North Marin Water District, and other City of Petaluma utilities.

Figure 2-1: Regional Location



Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. Data Sources:

Figure 2-2: Project Overview

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. Data Sources:

As shown in **Figure 2-2**, the existing force main was constructed adjacent to wetland riparian habitats across approximately one mile of its alignment. The groundwater level is shallow and the ground surface elevation varies from 10 feet to 15 feet across the project area. Jurisdictional waters, wetlands, and riparian habitats include McDowell Creek, Adobe Creek, and Shollenberger Marsh. McDowell Creek is a drainage located east of the SMART railroad right-of-way and west of the Marina Apartments complex. McDowell Creek is under the jurisdiction of Sonoma Water, formerly known as Sonoma County Water Agency, and is tidally influenced by the Petaluma River to its south. Adobe Creek is a branch of the Petaluma River and is also within the jurisdiction of Sonoma Water. The proposed project alignment would cross Adobe Creek in a corporate business park north of Shollenberger Marsh with Technology Lane to the west and Corporate Circle to the east. The location where the proposed project would cross the creek is over 3,000 feet from the confluence with the river and is dry during the summer months.

2.3.2 Existing Site Conditions

The existing 36-inch-diameter force main is approximately 2.5 miles long and was constructed in 1973, at the same time as the construction of the PIPS facility. The existing force main is constructed entirely of concrete lined and coated rod reinforced steel cylinder pipe (concrete cylinder pipe). The existing force main was installed in steel and concrete casings where it crosses under the SMART railroad tracks, McDowell Creek, Adobe Creek, and various drainage ditches. The existing force main crossing Adobe Creek was originally installed via open cut and is encased in concrete with approximately four feet of cover over the top of the pipe.

The current PIPS pumps, suction piping, and discharge piping were installed in 2001 as part of the Pond Influent Pump Station Upgrade Project. The PIPS contains four 450-horsepower (hp) pumps and two 60-hp sewage pumps. A standby engine generator set, hydropneumatic surge tank, and odor control system are located outside the pump station building.

At the ECWRF, the existing force main branches off in two different directions. One branch conveys flow from the existing force main to the plant headworks. The second branch was constructed to provide a connection point for the future parallel force main, although isolation valves were not installed on the second branch to facilitate the connection of the parallel force main. Without isolation valving on the existing force main, alternative temporary measures would need to be used to isolate the line upstream and downstream of the connection point. There is an existing trail within the City's ECWRF property that allows public access to the Petaluma Wetlands.

2.4 Proposed Project Description

The project would construct a new 12,835-foot-long, 36-inch-diameter sewer force main to improve the City's sewer collection system operational efficiency and redundancy. The proposed project would also construct a 2,100-foot-long Class 1 off-street multi-use bicycle pathway. Details are provided in the following sections.

2.4.1 PIPS Site Construction

Most of the existing facilities at the PIPS would not be modified as part of the proposed project. The only work that would occur inside the pump station is the installation of new piping to connect the parallel force main to an existing 36-inch-diameter discharge header. Additionally, electrical switchgear inside the pump station may require relocation.

2.4.2 ECWRF Site Construction

Construction activities at the ECWRF site would be minimal. At the ECWRF site, the new force main would be connected to the existing, underground spare branch on the existing force main. Isolation valves would be installed along the new force main.

2.4.3 Pipeline Construction

The parallel force main would be constructed using a combination of open-cut and trenchless microtunneling construction methods depending on the environmental constraints of the area.

2.4.3.1 Open-Cut Trenching

Open cut is a traditional pipeline construction method most commonly used for pipeline installation and includes trench excavation, placement of new bedding, installation of the new pipeline, backfill and compaction, and surface restoration. This method would be used for installation of the majority of the proposed project. The maximum trench width would be six feet, while the depth would range from 4 to 20 feet. Pavement restoration would adhere to the City's paving standards and the pavement would be restored back to its original thickness and condition.

2.4.3.2 Caltrans Right-of-way Crossing

California Department of Transportation (Caltrans) damaged and subsequently repaired a portion of the City's existing force main during their Highway 101 widening project in 2013. Caltrans proceeded to install a new 54-inch diameter welded steel casing under the SMART railroad tracks approximately 20 feet south of the existing force main to support the future construction of the proposed parallel force main. The proposed parallel force main would be constructed within an approximately 350-foot-long, 50-foot-wide easement through Caltrans right-of-way using a combination of open-cut trenching methods and installing pipe through the existing casing under the railroad tracks. The length of pipe that would be installed through the existing casing under the tracks is approximately 78 feet; the rest of the pipe through the Caltrans right-of-way would be installed using open-cut trenching methods. The ground surface is unpaved across the property.

Eventually, the existing force main must connect to the proposed parallel force main on both sides of the Caltrans right-of-way crossing because the City must abandon-in-place the existing force main as part of the easement terms and conditions, which do not allow for two pipelines through the Caltrans right-of-way. However, the proposed parallel force main would operate simultaneously with the existing force main within Caltrans right-of-way until the existing force main is abandoned. Construction of two large buried concrete vaults that would be necessary to house valving and tie-ins to connect the proposed parallel force main to the existing force main are not a part of this project. However, the proposed project includes construction of a buried tee and valve to facilitate connection to the future vault structures.

2.4.3.3 Microtunneling

Microtunneling is a remotely controlled, guided, pipejacking[2] process that provides continuous positive control of earth and groundwater pressures at the face of the excavation. The microtunnel boring machine (MTBM) and jacking pipes are pushed into the ground from a jacking shaft to a reception shaft on opposite

[2] Jacking is a construction method that pushes a pipe through an excavated hole.

sides of the crossing. The carrier or product pipe may be jacked directly or installed inside an oversized casing in a separate operation. For the purposes of this project, a steel casing would be installed via microtunneling and the force main would then be pulled through the casing. A cutter wheel excavates material at the face as the machine is jacked forward. The excavated material is mixed with clean slurry and pumped to the surface for separation and muck removal. Due to this slurry removal system and remote-controlled operation located on the surface, the microtunneling process does not require routine personnel entry into the pipe. Jacking or launch shaft sizes for microtunneling are typically 12 to 16 feet wide by 24 to 32 feet long. Reception shafts are typically 12 to 16 feet square. The depth of each varies depending on the designed depth of the casing being installed. A work area of approximately 12,000 to 20,000 square feet is required at the jacking shaft. Work area at the reception shaft can be smaller but is typically a minimum of 8,000 square feet. Off-site staging areas can be used to reduce work areas at each shaft.

Due to the anticipated high groundwater in the project area, the microtunneling shafts would need to be watertight. A typical way to achieve a water-tight shaft is to use interlocking sheet piles. Sheet piles can be installed in a variety of ways including pressing, vibratory driving, and impact. All methods require a crane to hoist the sheet piles into position. Pressing installation utilizes a hydraulic press or other equipment (e.g., backhoe), depending on the soil conditions, to provide the force to drive the sheet pile into the ground. Vibratory sheet pile driving uses vibratory hammers to decrease the resistance between the sheet pile and the surrounding soil and allows the sheet pile to be lowered into position. An impact hammer is typically used in hard or dense soil conditions, which are not anticipated for the proposed project. During the design phase of the project, project-specific geotechnical data would be interpreted to better inform the assumed type of sheet pile installation.

Microtunneling for the proposed project would provide a steering method that has adequate accuracy to reduce the risk of damage to creek infrastructure, the existing force main, and other nearby utilities. The excavation face is fully supported, which therefore reduces the risk of over-excavation that could lead to settlement. Microtunneling uses slurry pressure to counterbalance ground pressures, so the anticipated groundwater pressures are not a concern. Although no direct evidence of obstructions was found during initial site investigations, a large obstruction could cause significant problems for a microtunneling machine.

McDowell Creek

Microtunneling would most likely be used for the proposed pipeline crossing of McDowell Creek to avoid jurisdictional sensitive environmental resources. A 54-inch diameter steel casing would be installed beneath McDowell Creek using microtunneling. The McDowell Creek crossing would be 220 linear feet. Soils within the planned pipe zone under McDowell Creek are fill underlain with soft bay muds and groundwater is approximately 5 feet below the ground surface. The proposed pipe would most likely be located within the soft bay muds with high groundwater. The MTBM would be launched from an approximate 25- to 30-foot-deep, 12-foot by 32-foot launch pit likely located on the west side of the creek within the SMART property and would proceed east to an approximate 25- to 30-foot-deep, 10-foot by 15-foot reception shaft just east of the creek within the parking area for the Marina Apartments complex. A 54-inch-diameter casing would be installed across the creek and the 36-inch-diameter force main would be pulled into the casing. Approximately 12,000 to 20,000 square feet would be required for a microtunneling equipment staging and work area. This area would be generally located immediately adjacent to the MTBM launch location. Therefore, the City would acquire a temporary construction easement from SMART in order to secure enough work area for the contractor to perform the microtunneling operation.

Adobe Creek

Microtunneling would most likely be used for the proposed pipeline crossing of Adobe Creek due to footprint constraints and the presence of sensitive environmental resources. A 54-inch-diameter steel casing would be installed beneath Adobe Creek using microtunneling. The Adobe Creek crossing would be 900 linear feet. The MTBM would be launched from an approximate 30-foot-deep, 12-foot by 32-foot launch pit likely located where the existing force main easement intersects with the eastern edge of Corporate Circle and would proceed west approximately 900 feet to an approximate 30-foot deep, 10-foot by 15-foot reception shaft within the cul de sac of Technology Lane east of Adobe Creek. A 54-inch diameter casing would be installed across the creek and the 36-inch-diameter force main would be pulled into the casing. Approximately 12,000 to 20,000 square feet would be required for a microtunneling equipment staging and work area. This area would be generally located immediately adjacent to the microtunneling head launch location. The City would likely be able to use the existing easement and the public right of way along Corporate Circle to perform the microtunneling operation.

Storm Drains

Microtunneling would most likely be used for the proposed pipeline crossing under four large diameter shallow storm drains with diameters of 48, 42, 60, and 60 inches, just west of the ECWRF. A 54-inch diameter steel casing would be installed beneath the series of four storm drains using microtunneling. The storm drains crossing would be 300 linear feet. As in other locations along the alignment, the ground water in this area is close to the surface and the soils are a mixture of lean clay and sand. Just as in the creek crossings described above, the MTBM would be launched from an approximate 20- to 25-foot-deep, 12-foot by 32-foot launch pit likely located along an existing publicly accessible recreation trail within the City's property and would proceed west approximately 300 feet to an approximate 20- to 25-foot-deep, 10-foot by 15-foot reception shaft within the private property just east of the termination of the City's property. A 54-inch diameter casing would be installed under the storm drains and the 36-inch diameter force main would be pulled into the casing. Approximately 12,000 to 20,000 square feet would be required for a microtunneling equipment staging and work area. This area is generally located immediately adjacent to the microtunneling head launch location. The City would be able to use its own property to perform the microtunneling operation, which would likely involve temporarily closing access to the trail.

2.4.4 Dewatering

During both open-cut construction and construction of the launching and reception shafts for microtunneling it is expected that dewatering would be required because of high groundwater levels in the project area. Because groundwater in much of the project area has high salinity it will likely not be possible to discharge groundwater to the sewer system; dewatered groundwater would instead be discharged to the Petaluma River. Any discharges would be subject to appropriate permits from the Regional Water Quality Control Board. If groundwater quality meets requirements, discharge of groundwater would be covered under the Statewide Construction Stormwater General Permit (Order 2022-0057-DWQ). The City of Petaluma or the project contractor would file a Notice of Intent to obtain coverage under the General Permit and would prepare a Stormwater Pollution Prevention Plan (SWPPP) to ensure protection of water quality during construction. The plan would address discharge of dewatering water. The City would ensure that the contractor complies with all applicable water quality provisions required by the General Permit. Discharges would meet receiving water limits and pH and turbidity of the discharge would be monitored as required by the General Permit.

2.4.5 Maintenance Access Structures and Other Appurtenances Construction

The proposed parallel force main project would also involve installation of maintenance access structures, air release valves, and blow-off structures. Maintenance access structures[3] allow servicing of the pipeline after it has been installed underground. Air release valves are installed to provide an exit route for pockets of air that accumulate at high points along a pipeline. Blowoff structures are installed to provide an exit route for accumulated water and/or settled solids that accumulate at low points. The number and location of the maintenance access structures, air release valves, and blowoffs would be determined during design. Maintenance access structures may be spaced up to 2,000 feet apart; however, for the proposed project they may be spaced closer together. Air release valves and blowoffs would be installed within the maintenance access structures along the proposed 13,000-foot parallel force main.

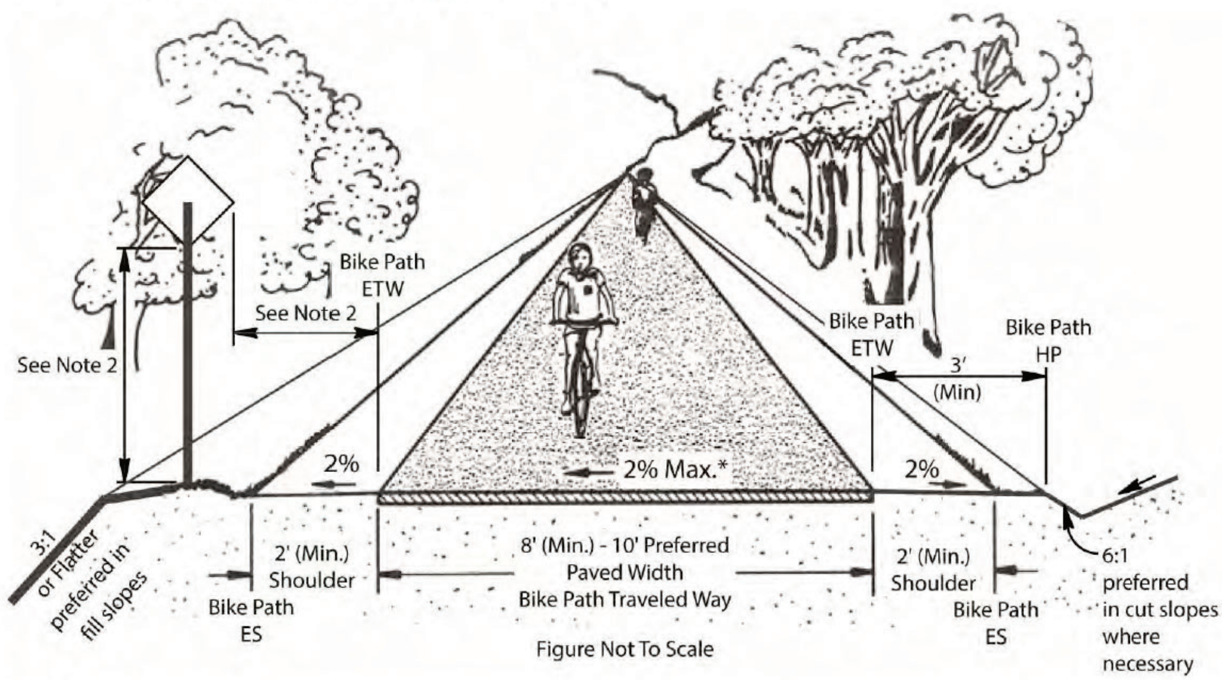
2.4.6 Multi-use Pathway Construction

The proposed project would construct a 2,100-foot-long Class 1 off-street multi-use bicycle pathway between Marina Avenue and Casa Grande Road. According to Chapter 1000 of the California Highway Design Manual (CA Department of Transportation, 2000), which is cited in the City of Petaluma Bicycle and Pedestrian Plan, a Class 1 Bikeway is an off-street pathway that may be shared with pedestrians. The minimum width of a two-way path is eight feet, but if pedestrian usage is expected to be high, 12-foot-wide paths are recommended. Both sides of the path should have a two-foot (three feet is preferred) graded shoulder of the same materials as the path to provide clearance from poles, trees, walls, fences, guardrails, or other obstructions. Recommended surfaces for multi-use trails are concrete, asphalt, and crushed stones (stones less than 3/8” diameter) mixed with stabilizing agents. These trails last longer, limit maintenance needs, are slip resistant, stay firm and stable during wet conditions, and are usable by people in wheelchairs. Obstacles or posts may be installed at the bikeway entry to discourage vehicles. Lighting for bicycle paths can encourage twilight and nighttime riding and deter vandalism. Lighting may be installed in intersections and where obstacles deter unauthorized vehicle entry to bicycle paths.

The existing Class 1 bikeways to the west and east of the proposed multi-use pathway are paved. Thus, it is assumed that the proposed multi-use pathway would consist of a 12-foot-wide path, paved with asphalt, with 3-foot shoulders on either side.

[3] Maintenance access structures were historically called manholes.

Figure 2-3: Typical Class 1 Bikeway Cross Section



NOTES:

(1) See Index 1003.1(15) for pavement structure guidance of bike path.

(2) For sign clearances, see California MUTCD, Figure 9B-1. Also, for clearance over the shoulder see Index 1003.1(3).

(3) The AASHTO Guide for the Development of Bicycle Facilities provides detailed guidance for creating a forgiving Class I bikeway environment.

*1% cross-slope minimum.

Source: California Highway Design Manual Chapter 1000

2.5 Construction Equipment

Construction of the proposed project would require a typical construction equipment fleet for open-cut trenching, construction equipment required to conduct microtunneling, and standard equipment for installation of the multi-use pathway. The assumed construction vehicle fleet is presented in **Table 2-1**.

Table 2-1: Assumed Construction Equipment Fleet

Phase	Equipment	Number	Fuel Type	Hours Per Day
Open-cut trenching	Excavators	1	Diesel	8
	Graders	1	Diesel	8
	Rubber Tired Dozers	1	Diesel	8
	Tractors/Loaders/Backhoes	3	Diesel	8
Microtunneling shafts	Tractors/Loaders/Backhoes	2	Diesel	8
	Cranes	1	Diesel	8
	Excavators	2	Diesel	8
	Off-Highway Trucks	1	Diesel	8
Microtunneling	Bore/Drill Rigs	1	Diesel	24
	Cranes	1	Diesel	4
	Air Compressors	2	Diesel	24
	Generator Sets	1	Diesel	24
	Pumps	2	Diesel	24
	Tractors/Loaders/Backhoes	1	Diesel	2
	Other Construction Equipment	3	Diesel	24
Connection at PIPS and ECWRF	Cranes	1	Diesel	7
	Forklifts	3	Diesel	8
	Generator Sets	1	Diesel	8
	Tractors/Loaders/Backhoes	3	Diesel	7
	Welders	1	Diesel	8
Restoration, paving and multi-use path construction	Cement and Mortar Mixers	2	Diesel	6
	Pavers	1	Diesel	8
	Paving Equipment	2	Diesel	6
	Rollers	2	Diesel	6
	Tractors/Loaders/Backhoes	1	Diesel	8

The total estimated volume of material to be excavated and removed from open trench construction of the pipeline would be approximately 28,000 cubic yards. This assumes open trench portions would accommodate a 36-inch pipeline with an outside diameter of 42 inches, and 12 inches of clearance to either side of the pipe (5.5 feet pipeline trench width x 12 feet average trench depth x 11,415 feet open trench length). Total estimated volume of material to be excavated and removed from microtunneling launching and receiving pits would be approximately 1,700 cubic yards. In accordance with City standards, all excavated trench material would be hauled off site and new fill material would be imported. Off haul and dumping is assumed to require a 20-mile round trip. To construct the multi-use pathway, a total estimated volume of up to 1,200 cubic yards (12 feet path width with 3 feet of sloped shoulder on each side x 1 foot deep to accommodate 3:1 shoulder slope requirement x 2,100 feet long) of material would be hauled on site as new fill. Construction would require haul truck trips to remove excavated material and truck trips to deliver pipe and fill material along the alignment. Up to 60 trips per day would be required at the peak of construction. Access to the construction area would be provided by Hopper Drive, Marina Avenue, Casa Grande Road, Technology Lane, McDowell Boulevard, and Cypress Drive.

2.6 Construction Schedule

Project construction is currently anticipated to begin in approximately November 2025 and is expected to last until September 2027. The construction schedule is subject to change, but is provided below to demonstrate durations of activities, though the exact dates may be different. Construction would consist of the following phases:

- Mobilization and potholing along the entire proposed alignment would occur from late December 2025 to early February 2026.
- Open-cut trenching would begin in January 2026 at the PIPS site, then continue west in the direction of the ECWRF at an average rate of approximately 70 linear feet per day. Maintenance access structures would be constructed by a second crew following behind the pipeline installation. Open-cut pipeline installation would be followed by testing, backfill, and surface restoration.
- Microtunnel crossing of McDowell Creek would be conducted in March to June 2026. The McDowell Creek crossing would begin with construction of launching and receiving shafts and installation of tunneling equipment, which would take approximately six weeks. Then, microtunneling of the steel casing would last approximately 10 days, which would be followed by approximately two days of installing the force main carrier pipe. After the force main is installed, it would be tested before the tunneling equipment would be removed and the launching and receiving shafts backfilled and resurfaced. Construction of the crossing would take about three months from mobilization to cleanup.
- Microtunnel crossing of Adobe Creek would be conducted in the dry season, and is expected to occur between June and November 2026. Construction of the crossing would take about five months from mobilization to cleanup. The Adobe Creek crossing would begin with construction of launching and receiving shafts and installation of tunneling equipment, which would take approximately six weeks. Then, microtunneling of the steel casing would last approximately 43 days, which would be followed by approximately eight days of installing the force main carrier pipe. After the force main is installed, it would be tested before the tunneling equipment would be removed and the launching and receiving shafts backfilled and resurfaced.
- Microtunnel crossing of the large storm drains west of the ECWRF would take about three months from mobilization to cleanup and is currently scheduled from February through May 2027. The storm drains crossing would begin with construction of launching and receiving shafts and installation of tunneling equipment, which would take approximately six weeks. Then, microtunneling of the steel casing would last approximately 10 days, which would be followed by approximately two days of installing the force main carrier pipe. After the force main is installed, it would be tested before the tunneling equipment would be removed and the launching and receiving shafts backfilled and resurfaced.

- The Caltrans right-of-way and SMART railroad tracks crossing would take about three months from mobilization to cleanup. It is currently scheduled to be constructed from February to May 2026. Construction would begin with construction of launching and receiving shafts and installation of tunneling equipment, which would take approximately six weeks. Then, microtunneling of the steel casing would last approximately 7 days, which would be followed by approximately two days of installing the force main carrier pipe. After the force main is installed, it would be tested before the tunneling equipment would be removed and the launching and receiving shafts backfilled and resurfaced.

- Connection of the force main at the PIPS and ECWRF sites would occur over a three-month period, following the completion of the open-trench and microtunneling installations.

- Grading and paving of proposed pathway, with reconstruction of culverts crossed by the path as, needed. Pathway construction is expected to last about three months.

- After construction is complete, all pipeline construction areas would be restored to pre-construction conditions (i.e., no permanent disturbance footprint). Final paving, surface restoration, and site cleanup would last about two weeks.

All construction would occur during daytime hours (i.e., weekdays between 7 am and 10 pm) in accordance with City of Petaluma noise performance standards, with the exception of microtunneling. Microtunneling would require 24-hour construction while the MTBM is actively tunneling. All of the construction work can be performed while the existing sewer system remains active.

2.7 Equipment Staging Areas

The City may reserve land at the PIPS and ECWRF for staging. Staging that may be required between those two areas would be on private property and would require a temporary easement. Ultimately, it would be the responsibility of the selected construction contractor to secure the required temporary easements on private property for staging purposes.

For the proposed pipeline crossing of McDowell Creek, approximately 12,000 to 20,000 square feet would be required for a microtunneling staging and work area. This area would likely be located adjacent to the MTBM launch location on the west side of the creek within the SMART property. Therefore, the City would acquire a temporary construction easement from SMART to perform the microtunneling operation. The exact dimensions and location of the required work area and temporary construction easement would be developed during final design.

For the proposed pipeline crossing of Adobe Creek, approximately 12,000 to 20,000 square feet would be required for a microtunneling staging and work area. This area would likely be located adjacent to the MTBM launch location, where the existing force main easement intersects with the eastern edge of Corporate Circle. The City would use the existing force main easement and the public right of way along Corporate Circle to perform the microtunneling operation. The exact dimensions and location of the required work area and confirmation of need for temporary construction easement in this area would be developed during final design.

For the proposed pipeline crossing under the four large diameter shallow storm drains just west of the ECWRF, approximately 12,000 to 20,000 square feet would be required for a microtunneling staging and work area. This area would likely be located adjacent to the MTBM launch location, along the existing trail within the City's property. The City would use its own ECWRF property to perform the microtunneling operation, although it would temporarily close access to the trail. The exact dimensions and location of the required work area in this area would be developed during final design.

2.8 Operations

The pipeline and maintenance access structures would not be associated with long-term energy usage or additional City operations and maintenance activities. Project operation and maintenance activities would include inspection and repair, as necessary, of pipeline and maintenance access structures. The pathway is expected to require regular mowing on either side of the path and periodic, though infrequent, repaving.

2.9 Environmental Commitments

The following measures are construction best management practices (BMPs) that would be implemented as part of the project:

- The design and construction of the facilities would be based on the geotechnical investigation report to minimize geological risk.
- Groundwater dewatering discharges would be disposed of in accordance with applicable state and local requirements and would be covered under the Statewide Construction Stormwater General Permit.
- All construction work would require the contractor to implement a Health and Safety Plan.
- Specifications would require the contractor to prepare a Stormwater Pollution Prevention Plan (SWPPP). In accordance with the SWPPP, the contractor would implement BMPs during construction to control water quality of storm water discharges off site, such as site management "housekeeping," erosion control, sediment control, tracking control and wind erosion control. The SWPPP would also cover groundwater dewatering discharges.

2.10 Required Permits and Approvals

Anticipated permits are identified in **Table 2-2.** As of the writing of this report, it is not believed that the proposed parallel force main is within Bay Conservation and Development Commission (BCDC) jurisdiction. Therefore, an application to BCDC and a new Major Permit is assumed to not be needed. However, this would be further investigated during design.

Table 2-2: Permits and Approvals

Agency	Permit	Resource Issue
Amy Corps of Engineers	§404 Clean Water Act Permit	Jurisdictional Wetlands and Waters of the US
National Marine Fisheries Service	Consultation(**)	Special-status Species (Steelhead) in Adobe Creek
U.S. Fish and Wildlife Service	Consultation(**)	Special-status Species (California red-legged frog)
California Department of Fish and Wildlife	Lake or Streambed Alteration Agreement	Adobe Creek/Riparian Woodlands/Waters of the State
California Department of Fish and Wildlife	Consultation(**)	Special-status Species (Foothill yellow-legged frog and Western Pond Turtle)
San Francisco Bay Water Quality Control Board	§401 Water Quality Certification Discharge permit for dewatering water, if required	Wetlands/Waters/Water Quality
State Water Resources Control Board	Notice of Intent to obtain coverage under NPDES Construction General Permit and Approval of a SWPPP	Water Quality from construction discharges
Caltrans	Encroachment Permit	Highway 101
Caltrans	Sewer force main easement	Highway 101
Sonoma-Marin Area Rail Transit (SMART)	Entry Permit	Train Tracks
Bay Area Air Quality Management District (BAAQMD)	Regulation 6-6 Particulate Matter - Prohibition of Trackout monitoring and document retention	Fugitive dust emissions during construction
City of Petaluma	Encroachment Permit Building and Grading Permit Waste Discharge Permit	Local Roads Building and Grading Discharge to sewer system
City of Petaluma Community Development Department	Tree Removal Permit	Removal or trimming of trees protected by City of Petaluma Tree Preservation Ordinance
Sonoma County Water Agency	Encroachment Permit	McDowell Creek, Adobe Creek
Occupational Safety and Health Administration (OSHA)	Tunneling Permit, Shoring Design Permit	Microtunneling/PTGAB

**The use of trenchless techniques to avoid jurisdictional resources at McDowell and Adobe creeks would avoid the need for Incidental Take Permits from the National Marine Fisheries Service, U.S. Fish and Wildlife Service, and California Department of Fish and Wildlife.

3. ENVIRONMENTAL CHECKLIST FORM

1. **Project title:** Primary Influent Pump Station (PIPS) Parallel Force Main Project

2. **Lead agency name and address:** City of Petaluma
11 English Street
Petaluma, CA 94952

3. **Contact person and phone number:** Kristin Arnold
Senior Civil Engineer
karnold@cityofpetaluma.org
707) 780-7892

4. **Project location:** City of Petaluma,
Sonoma, California

5. **Project sponsor's name and address:** Same as Lead Agency

6. **General plan designations:** Public/semi-public, city park, business park, high-density residential, and mixed use

7. **Zoning:** Planned community development, business park, open space-park, residential, mixed use, urban center, and urban core

8. **Description of project:** The project would construct an approximately 13,000-foot-long, 36-inch-diameter new sewer force main parallel to the existing City force main between the Primary Influent Pump Station (PIPS) and the Ellis Creek Water Recycling Facility (ECWRF) to improve the City's sewer collection system operational efficiency and redundancy. The proposed project also includes construction and operation of a 2,100-foot-long Class 1 off-street multi-use pedestrian and bicycle pathway between Marina Avenue and Casa Grande Road.

9. **Surrounding land uses and setting:** The project would be constructed within the City PIPS and ECWRF properties, as well as vacant land, roadways, parking lots, and existing residential, commercial and industrial development. The project would cross California Highway 101, Sonoma-Marin Area Rail Transit (SMART) railroad tracks, McDowell Creek, and Adobe Creek. Surrounding land uses also include the Petaluma Wetlands and trails.

10. **Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)**
    - Amy Corps of Engineers: Section 404 Clean Water Act Permit
    - California Department of Fish and Wildlife: Lake or Streambed Alteration Agreement
    - San Francisco Bay Water Quality Control Board: Section 401 Water Quality Certification, discharge permit for dewatering water
    - State Water Resources Control Board: Coverage under Construction General Permit, including Approved SWPPP
    - Caltrans: Encroachment Permit, Sewer force main easement

- Sonoma-Marin Area Rail Transit (SMART): Entry Permit
- Bay Area Air Quality Management District (BAAQMD): Retention of trackout monitoring logs and reporting to the air pollution control officer, if requested
- City of Petaluma: Encroachment Permit
- City of Petaluma: Waste Discharge Permit
- City of Petaluma: Tree removal permit
- Sonoma Water: Encroachment Permit
- Occupational Safety and Health Administration (OSHA): Tunneling Permit, Shoring Design Permit

11. Have California Native American tribes traditionally and culturally affiliated with the Project area requested consultation pursuant to Public Resources Code section 2180.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?

In accordance with PRC Section 21080.3.1(d), the City of Petaluma provided written formal notification to the Federated Indians of Graton Rancheria (FIGR) on September 14, 2023, which included a brief description of the proposed project and its location, the City's contact information, and a notification that FIGR has 30 days to request consultation pursuant to this section. The City received a response requesting consultation under PRC Section 21080.3.1(b)(2) from the FIGR on October 4, 2023. The City entered into consultation with FIGR, coordinated on a routine basis, and provided requested information. FIGR requested that project construction activities be conducted with the presence of a Tribal Monitor, which has been imposed as TRC-1.

Environmental Factors Potentially Affected

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

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

DETERMINATION: (To be completed by Lead Agency)

On the basis of this initial evaluation:

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

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

[ ] I find that the proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

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

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

Signature | Date
Printed Name | Title

3.1 Aesthetics

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

Discussion

The City of Petaluma is located within the Petaluma River Valley, which extends northwest-southeast between Sonoma Mountain and Mount Burdell. The City is flanked by foothills and peaks associated with Sonoma Mountain and Mount Burdell, which provide views of rolling landscapes and agricultural land (City of Petaluma 2006). The City is also traversed by the Petaluma River and several creek corridors that contribute to the aesthetic quality of the City (City of Petaluma 2006). The Petaluma River's headwaters are several miles to the north of the City, flowing through farmlands, the center of Petaluma, and finally through rich marshlands as the river makes it way to San Pablo bay (City of Petaluma 2006).

The project site is located within the Central Petaluma Specific Plan subarea of the City of Petaluma General Plan, which is characterized by the Petaluma River, Turning Basin, and an active rail corridor. Older warehouses and light industrial uses mixed with new office and residential developments are located west of the river in an area historically referred to as the warehouse district. The Rocky Memorial Dog Park and the Petaluma Marina, which provide public views of surrounding hillsides, are located south of the project site.

a) Have a substantial adverse effect on a scenic vista?

PIPS Parallel Force Main

The primary scenic impairments associated with the new parallel force main would be temporary and would occur during the construction phase. During construction, scenic views of the surrounding hills and of the Petaluma River near the project site would be temporarily altered and obstructed by construction workers, equipment, and vehicles. Although construction activities would result in visual changes, these potential visual impacts would be short-term. Temporary impacts on scenic vistas would cease upon completion of the new parallel sewer force main. Once the new parallel force main is completed, the area of temporary disturbance would be restored to its original condition and would not obstruct any long-term views. Additionally, the new parallel force main does not include new aboveground components and would not be visible upon completion with the exception of the maintenance holes within roadways. Therefore, the project would have no long-term impact on scenic vistas. Impacts would be less than significant.

Multi-Use Pathway

Similar to the new parallel force main, primary scenic impairments associated with the multi-use pathway would be temporary and short-term during the construction phase. Construction activities would temporarily obstruct scenic views of the surrounding hills and of the Petaluma River near the project site. Once the construction of the multi-use path is complete, obstruction of scenic views would cease, and new opportunities to experience scenic vistas from the multi-use pathway would be available. Therefore, impacts would be less than significant.

Mitigation Measures

None required.

Significance Determination

Less than significant.

b) Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?

Caltrans manages the State Scenic Highway Program, which was created by the State Legislature in 1963 with the purpose of protecting the natural scenic beauty of California Highways. Caltrans assigns responsibility for the regulation of land use and development along State Scenic Highways to the appropriate State and local governmental agencies. Highways receive a designation based on how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler’s enjoyment of the view. There is no designated State Scenic Highway in the City of Petaluma (Caltrans 2019). Both the proposed parallel force main and the multi-use pathway are not located within the viewshed of a State scenic highway. Therefore, there would be no impact on scenic resources associated with a State scenic highway.

Mitigation Measures

None required.

Significance Determination

No impact.

c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

PIPS Parallel Force Main

The new parallel force main would approximately follow the alignment of the existing City force main, which is characterized by streets, parking lots, vacant land, dirt pathways, and commercial and industrial developments. Construction would traverse two creek corridors that contribute to the City's visual character, McDowell Creek and Adobe Creek, via trenchless microtunneling that would not permanently change the creeks. Public views of the project construction from roadways would be fleeting – on the order of seconds or minutes – while public views of the construction from sidewalks and bicycle lanes would be longer. This short-term effect on visual continuity is considered less than significant because after construction the alignment would be returned to existing conditions or otherwise improved. Project impacts on visual character and public views would be less than significant.

Multi-Use Pathway

The multi-use pathway would be constructed between Marina Avenue and Casa Grande Road. Parcels that overlay and are adjacent to the multi-use pathway are classified as mixed use, commercial, residential, planned community development, and open space parks. Construction of the multi-use pathway would involve paving over existing vacant land. However, the multi-use pathway would allow views of Rocky Dog Memorial Park and provide easier access. In addition, the multi-use pathway would provide additional opportunities for the public to view the Petaluma River and Mount Burdell. The proposed multi-use pathway would support several policies in the City of Petaluma General Plan 2025 related to enhancing the City's most prominent visual resource, the Petaluma River:

> 3-P-28 Foster connections to the river from surrounding areas and ensure that new development adjacent to the river is oriented toward it.
>
> 3-P-36 Provide vistas eastward to the Petaluma River and across toward Sonoma Mountain.
>
> 3-P-53 Promote greater accessibility and views to Petaluma River through road extensions, bikeways, and trails, including … requiring new development to be oriented to the river, and provide continuous public access parallel to the riverfront.

Similar to the Parallel PIPS Force main, construction activities would only cause temporary short-term impacts to public views due to construction equipment and activities, and thus, impacts would be less than significant.

Mitigation Measures

None required.

Significance Determination

Less than significant.

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

The City of Petaluma Implementing Zoning Ordinance *Section 21.040(D)* provides standards to prevent indirect and direct glare impacts including maximum illumination, light location, height, and relationship to structures. Existing sources of light and glare along the proposed alignment include streetlights, windows on existing buildings, and windshields in existing parking lots.

PIPS Parallel Force Main

Construction of the proposed parallel force main would occur within daytime hours (i.e., weekdays between 7 am and 10 pm) in accordance with City of Petaluma noise performance standards except for microtunneling. Microtunneling would require 24-hour construction hours while the MTBM is actively tunneling. Construction would temporarily create a minor new source of light and glare from construction equipment. Impacts are considered less than significant because construction would be temporary and equipment would be removed once site restoration is complete. Once construction is complete, no permanent lights or sources of glare would be installed as part of the new parallel force main. Additionally, **Mitigation Measure AES-1** would be implemented to reduce the potential impact of construction lighting during nighttime construction. Therefore, the project would not create additional light or glare at the project site; there would be no long-term impact to daytime and nighttime views in the area.

Multi-Use Pathway

Construction of the multi-use pathway would occur within daytime hours in accordance with City of Petaluma noise performance standards. Similar to the PIPS Parallel Force Main, construction of the multi-use pathway would create a minor source of light and glare from construction equipment. Lighting would be installed in intersections where obstacles deter unauthorized vehicle entry to bicycle paths. The project would be required to comply with Zoning Ordinance *Section 21.040(D)(Glare),* which provides standards to prevent indirect and direct glare impacts including:

- No such direct glare shall be permitted with the exception that parking areas and walkways may be illuminated by luminaries so hooded or shielded that the maximum angle of the cone of direct illumination shall be 60 degrees if the luminary is not less than six feet above the ground. Such luminary shall be placed no higher than the principal structure on the site if attached to said structure, and if not attached to the principal structure, no higher than twenty feet unless the Zoning Administrator determines that special operational circumstances of the subject property require higher light standards. The maximum illumination at ground level shall not be in excess of three foot candles;

- Indirect glare shall not excel that value which is produced by an illumination of the reflecting surface not to exceed .3 candles (maximum) and .1 foot candle (average);

- Deliberately induced sky-reflected glare, as by casting a beam upward for advertising purposes, is specifically prohibited without the issuance of a temporary sign permit.

Compliance with Zoning Ordinance *Section 21.040(D)* would ensure that the project's potential light and glare impacts would be less than significant.

Mitigation Measures

The following mitigation measure shall be incorporated into the PIPS parallel force main component of the project to reduce potential impacts from light spillage and disturbance to sensitive receptors in the project area during nighttime construction. The proposed project's aesthetics impacts would be less than significant with mitigation incorporated.

> **Mitigation Measure AES-1: Construction Lighting.** Should nighttime construction be required, a construction safety lighting plan shall be submitted to the City for review and approval prior to any nighttime construction activities. The Construction Safety Lighting Plan shall require that all construction-related lighting fixtures (including portable fixtures) shall be oriented downward and away from adjacent sensitive areas (including residential and biologically sensitive areas) and that all lighting shall consist of the minimal wattage necessary to provide safety at the construction site.

Significance Determination

Less than significant with mitigation incorporated.

3.2 Agriculture and Forestry Resources

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	[ ]	[ ]	[ ]	[X]
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	[ ]	[ ]	[ ]	[X]

c) Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	[ ]	[ ]	[ ]	[X]
D) Result in the loss of forest land or conversion of forest land to non-forest use?	[ ]	[ ]	[ ]	[X]
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	[ ]	[ ]	[ ]	[X]

Discussion

The California Department of Conservation, Farmland Mapping and Monitoring Program (FMMP) classifies agricultural land according to soil quality and irrigation status. Based on data from the FMMP, land classifications within the city consist of prime farmland, grazing land, farmland of local importance, other land, and urban and built-up land. Agricultural resources are prevalent outside of City limits, within the County of Sonoma.

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

The project site would be located within Urban and Built-Up Land, Farmland of Local Importance, and Other Land as classified by the California Department of Conservation (**Figure 3-1**). No permanent above-ground facilities are proposed within farmland area. The proposed project would not convert farmland to non-agricultural use; therefore, there would not be impact.

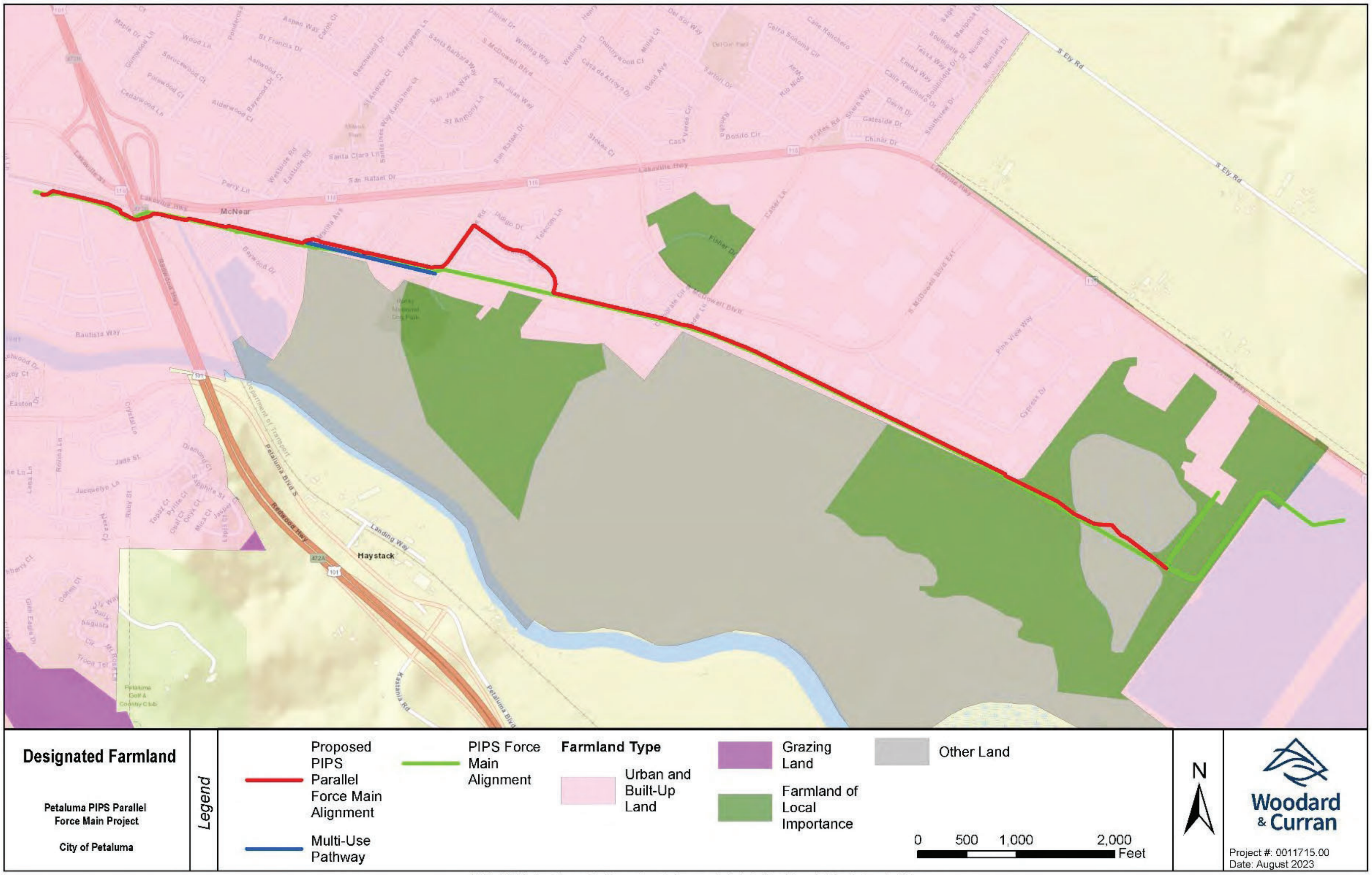
Mitigation Measures

None required.

Significance Determination

No impact.

Figure 3-1: Farmland



Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. Data Sources: California Department of Conservation

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

The proposed project site would not be located on land zoned for agricultural use (City of Petaluma 2006) or protected by a Williamson Act Contract. Per the City of Petaluma Zoning Map (City of Petaluma n.d.), parcels that overlay and are adjacent to the new sewer force main are zoned as mixed use, residential, open space-park, business park, commercial, and planned community developments. Portions of the new sewer force main would be within the Central Petaluma Specific Plan. The Specific Plan parcels that overlay and are adjacent to the new sewer main are zoned river dependent industrial district, civic space, urban center, and urban core. Therefore, no impact would occur as a result of the proposed project.

Mitigation Measures

None required.

Significance Determination

No impact.

c) Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

There is no land zoned or designated for forest land or timberland within the City of Petaluma (City of Petaluma 2006). Therefore, the proposed project would have no impact.

Mitigation Measures

None required.

Significance Determination

No impact.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

There is no designated forest land or timberland within the City of Petaluma (City of Petaluma 2006). There are no forestry or timberland resources in the project area. Therefore, the proposed project would have no impact related to the loss of forest land or timberland.

Mitigation Measures

None required.

Significance Determination

No impact.

e) Involve other changes in the existing environment, which due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

The proposed project would create redundancy for the existing PIPS force main. Additionally, the multi-use pathway would provide citizens with safe and direct off-street bicycle and pedestrian travel. The proposed project would not involve other changes in the existing environment and it would not result in conversion of agricultural land to non-agricultural use. The proposed project would have no impact toward conversion of farmland or forest land to non-agricultural or non-forest use.

Mitigation Measures

None required.

Significance Determination

No impact.

3.3 Air Quality

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	[ ]	[X]	[ ]	[ ]
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non- attainment under an applicable federal or state ambient air quality standard?	[ ]	[X]	[ ]	[ ]
c) Expose sensitive receptors to substantial pollutant concentrations?	[ ]	[X]	[ ]	[ ]
d) Result in other emissions (such as those leading to odors or adversely affecting a substantial number of people?	[ ]	[ ]	[X]	[ ]

Discussion

The City of Petaluma is located within the San Francisco Bay Area Air Basin (SFBAAB), which is regulated by the Bay Area Air Quality Management District (BAAQMD). Air quality within the SFBAAB is affected by natural geographical and meteorological conditions as well as human activities such as construction and development, operation of vehicles, industry and manufacturing, and other air pollution emission sources. The Federal Clean Air Act and the California Clean Air Act establish national and state ambient air quality standards. The National Ambient Air Quality Standards (NAAQS), which are required to be set by the United States Environmental Protection Agency (US EPA) under the Clean Air Act, provide public health protection, including protecting the health of sensitive populations such as asthmatics, children, and the elderly (US EPA 2023). Similarly, the California Ambient Air Quality Standards (CAAQS), which are required to be set by the California Air Resources Board (CARB), are established to protect the health of the most sensitive groups and are mandated by State law. US EPA has set NAAQS for six pollutants, which are called "criteria pollutants:" carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), Particulate Matter (PM_{10} and $PM_{2.5}$), and sulfur dioxide (SO_2). In addition to these, California has added three criteria pollutants: hydrogen sulfide (H_2S), visibility reducing particles, and vinyl chloride. In total, California regulates about 200 different chemicals, referred to as toxic air contaminants (TACs) (CARB 2023). The BAAQMD and the CARB monitor the following criteria air pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and Pb. The BAAQMD is responsible for planning, implementing, and enforcing air quality standards within the SFBAAB including the City of Petaluma.

Depending on whether the NAAQS or CAAQS are met or exceeded, the SFBAAB is classified as being in "attainment" or "nonattainment." Attainment status means that measured pollutant concentrations did not exceed the ambient air quality standards and BAAQMD generally must develop a maintenance plan to ensure attainment is maintained. A non-attainment status means that measured pollutant concentrations have exceeded the ambient air quality standards and BAAQMD must develop a plan to reach attainment status. As shown in **Table 3-1**, the SFBAAB is designated as non-attainment for both the one-hour and eight-hour state ozone standards, which are 0.09 parts per million (ppm) and 0.070 ppm, respectively. The SFBAAB is also in non-attainment for the PM_{10} and $PM_{2.5}$ state standards, which are an annual arithmetic mean of less than 20 $\mu g/m^3$ for PM_{10} and less than 12 $\mu g/m^3$ for $PM_{2.5}$ and a 24-hour average of 50 $\mu g/m^3$ for PM_{10}. In addition, the SFBAAB is designated as non-attainment for the federal 24-hour $PM_{2.5}$ standard and will be required to prepare a State Implementation Plan (SIP) for $PM_{2.5}$. All other national and state ambient air quality standards within the SFBAAB are in attainment.

Table 3-1: Criteria Pollutant Attainment Status – SFBAAB

Criteria Pollutant	State CAAQS	Federal (NAAQS)
O_3 – 1-hour standard	Non-attainment	Not applicable (n/a)
O_3 – 8-hour standard	Non-attainment	Non-attainment
PM_{10} 24-hour	Non-attainment	Unclassifiable
PM_{10} annual	Non-attainment	n/a
$PM_{2.5}$ 24-hour	n/a	Non-attainment
$PM_{2.5}$ annual	Non-attainment	Unclassifiable/ Attainment
CO (both 1- and 8-hour)	Attainment	Attainment
NO_2 (both 1-hour and annual)	Attainment	Attainment
SO_2	Attainment	Designation unavailable
Pb (both 30-day and 3-month)	Designation unavailable	Attainment
Visibility Reducing Particles	Unclassified	n/a
Hydrogen Sulfide (H_2S)	Unclassified	n/a
Vinyl Chloride	No information available	n/a

Source: BAAQMD 2023

BAAQMD prepared the 2017 Bay Area Clean Air Plan as an update to BAAQMD's state O_3 plan, the 2010 Clean Air Plan. The 2017 Clean Air Plan focuses on two goals: protect air quality and health at the regional and local scale and protect the climate. The subgoals of the first goal are to attain all state and national air quality standards, and to eliminate disparities among Bay Area communities in cancer health risk from TACs. The subgoal of the second goal is to reduce Bay Area greenhouse gas (GHG) emissions 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050. The 2017 Clean Air Plan includes an integrated set of 85 control measures to reduce O_3 precursors, ROG and NO_X, reduce transport of O_3 and its precursors to neighboring air basins, protect public health by reducing emissions of PM and TACs, and reduce GHG emissions across economic sectors. Some measures focus on reducing a single type of air pollutant; however, many of the measures reduce multiple pollutants and protect both public health and the climate. To implement the control strategy, BAAQMD draws upon its existing mechanisms, such as rulemaking enforcement and permitting, and development and promotion of best practices.

The BAAQMD CEQA Air Quality Guidelines were established in May 2012 and updated in May 2017 to evaluate air quality emissions of CO, ozone precursors (ROG and NO_X) and particulate matter, PM_{10} and $PM_{2.5}$, from construction and operation of projects within the SFBAAB. The thresholds of significance for air quality were re-evaluated in 2022 (BAAQMD 2022) and BAAQMD adopted thresholds that remained unchanged from the previously adopted thresholds of significance. These thresholds are designed such that a project consistent with the thresholds would not have an individually or cumulatively significant impact on the SFBAAB air quality. The City of Petaluma recognizes that the BAAQMD air quality thresholds of significance adopted in 2022 represent the best available scientific data and has elected to rely on them in determining screening levels and significance. The BAAQMD air quality thresholds are listed in **Table 3-2**.

Table 3-2: BAAQMD Air Quality Significance Thresholds

Pollutant	Average Daily Emissions - Construction Thresholds (pounds/day)	Average Daily Emissions – Operation Thresholds (pounds/day)
NO_x	54	54
ROG	54	54
PM_{10} (exhaust only)	82	82
$PM_{2.5}$ (exhaust only)	54	54
Local CO	none	9.0 ppm (8-hour average), 20.0 ppm (1-hour average)
Toxic Air Contaminants	• Increased Cancer Risk of > 10 in 1 million • Increased non-cancer risk of > 1.0 Hazard Index (Chronic or Acute) • Ambient $PM_{2.5}$ increase of > 0.3 μg/m^3 annual average Zone of influence: 1,000-foot radius from property line of source	
Odor	5 confirmed complaints per year averaged over three years	

Source: BAAQMD 2022

The City's General Plan sets forth policies and programs to maintain and enhance air quality. Policies that are applicable to the project include:

4-P-15-C. Continue to require development projects to abide by the standard construction dust abatement measures included in BAAQMD's CEQA Guidelines. These measures would reduce exhaust and particulate emissions from construction and grading activities.

4-P-16 To reduce combustion emissions during construction and demolition phases, the contractor of future individual projects shall encourage the inclusion in construction contracts of the following requirements or measures shown to be equally effective:

- Maintain construction equipment engines in good condition and in proper tune per manufacturer's specification for the duration of construction;
- Minimize idling time of construction related equipment, including heavy-duty equipment, motor vehicles, and portable equipment;
- Use alternative fuel construction equipment (i.e., compressed natural gas, liquid petroleum gas, and unleaded gasoline);
- Use add-on control devices such as diesel oxidation catalysts or particulate filters;
- Use diesel equipment that meets the CARB's 2000 or newer certification standard for offroad heavy-duty diesel engines;
- Phase construction of the project;
- Limit the hours of operation of heavy duty equipment.

a) Conflict with or obstruct implementation of the applicable air quality plan?

The BAAQMD Guidelines (BAAQMD 2022) recommend that a project's consistency with the applicable air quality plan be evaluated with respect to the following questions:

a. Does the project support the primary goals of the air quality plan?

b. Does the project include applicable control measures from the air quality plan?
c. Does the project disrupt or hinder implementation of any air quality plan control measures?

If all the questions can be answered in the affirmative, as supported by substantial evidence, then the project is consistent with air quality plans prepared for the SFBAAB.

The current air quality plan is the BAAQMD 2017 Bay Area Clean Air Plan (BAAQMD 2017). BAAQMD recommends that a project be evaluated to determine whether it supports the 2017 Bay Area Clean Air Plan goals by comparing project emissions to the BAAQMD thresholds of significance. If emissions would not exceed the thresholds of significance after incorporation of all feasible mitigation measures, then the project would be considered consistent with the 2017 Bay Area Clean Air Plan. Construction and operational emissions from the project are presented below, under question "b," compared to the BAAQMD thresholds of significance. As shown in **Table 3-3**, proposed project emissions would be well below the BAAQMD significance thresholds.

The 2017 Bay Area Clean Air Plan contains 85 control measures to reduce air pollution in the SFBAAB. Projects that incorporate all feasible control measures are considered consistent with the 2017 Bay Area Clean Air Plan. Use of medium- and heavy-duty vehicles for the project would comply with applicable diesel emission standards for on-road and off-road engines, consistent with the 2017 Bay Area Clean Air Plan's measures requiring the use of cleaner diesel-fueled engines.

The project would comply with BAAQMD Regulation 6, Rules 1 and 6, which control fugitive emissions of particulate matter by prohibiting emission of visible particles beyond the project property, and prohibiting trackout of dirt onto paved roads around the project property.[4] In addition, the proposed project would implement all applicable BAAQMD basic dust control measures, requiring measures such as watering of exposed soils, watering unpaved construction roads, limiting vehicle speeds on unpaved areas, and sweeping paved roads be implemented during construction. Thus, construction of the project would be consistent with all applicable control strategies in the 2017 Bay Area Clean Air Plan. Because construction of the project would be consistent with all three criteria identified by the BAAQMD to evaluate consistency with the 2017 Bay Area Clean Air Plan, impacts with respect to conflicting with or obstructing implementation of the 2017 Bay Area Clean Air Plan would be less than significant.

Mitigation Measures

See **Mitigation Measure AIR-1 Best Management Practices for Construction-Related Fugitive Dust Emissions**, as described below.

Significance Determination

Less than significant with mitigation incorporated.

[4] "Trackout" is defined in Regulation 6 Particulate Matter Rule 6 Prohibition of Trackout as, "any sand, soil, dirt, bulk material or other solid particles from a site that adhere to or agglomerate on the exterior surfaces of vehicles [including tires], and subsequently fall or are dislodged onto a paved public roadway or the paved shoulder of a paved public roadway on the path that vehicles follow at any exit and extending 50 feet out onto the paved public roadway beyond the boundary of the site."

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non- attainment under an applicable federal or state ambient air quality standard?

The proposed project would result in emissions of criteria pollutants from short-term construction activities. Construction emissions were estimated using the California Emissions Estimator Model (CalEEMod) 2022.1.1.20, which is used throughout California to quantify criteria pollutants and greenhouse gas emissions (GHGs).

The CalEEMod emissions scenarios were based on project-specific information (see Section 2 Project Description). In instances where project-specific information was not available (e.g., construction equipment horsepower, length of worker trips, soil moisture content), the analysis relied on CalEEMod default values for construction activities. As explained in Section 2.6 Construction Schedule, project construction is anticipated to begin in approximately November 2025 and is expected to last until September 2027, or 22 months. The modelling was conducted early in the proposed project planning process when construction was anticipated to last 17 months, between January 2025 and May 2026. Thus, the modeled average daily emissions results are conservative because they assume construction would be compressed into a faster time frame than may actually be carried out. A longer duration for construction equates to lower average daily emissions. Furthermore, modeling emissions in near term years assumes use of dirtier construciton vehicle fleets, as CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation phasing schedule - which is built into CalEEMod assumptions - requires gradual phasing-in of clean engines between 2024 and 2035. The model also assumes compliance with BAAQMD Regulation 6, Rules 1 and 6, and BAAQMD best management practices for construction-related fugitive dust, which control fugitive emissions of particulate matter, by requiring measures such as watering of exposed soils, watering unpaved construction roads, limiting vehicle speeds on unpaved areas, and sweeping paved roads be implemented during construction.

Construction Emissions

The criteria air pollutant emissions from construction of the proposed project were estimated using CalEEMod version 2022.1.1.20. The tables below present the maximum daily emissions for each of the modeled criteria air pollutants for which the San Francisco Air Basin has not attained national and/or State criteria. **Table 3-3** presents total mass daily emissions and shows that the project's construction emissions would not exceed regional thresholds.

Table 3-3: Proposed Project Average Daily Construction Emissions Compared to Regional Thresholds (pounds/day)

Modeled Construction Year	NO_x	ROG	$PM_{2.5}$ Exhaust	PM_{10} Exhaust
2025	31.5	3.5	1.24	1.34
2026	3.6	0.4	0.13	0.14
BAAQMD Regional Thresholds	*54*	*54*	*54*	*82*
Threshold exceeded?	**No**	**No**	**No**	**No**

Note: Emissions represent the maximum of winter or summer and are rounded to the nearest whole number.

During construction, earth moving activities, grading, material hauling, and soil disturbance have the potential to release dust and particulate matter. The City would incorporate the BAAQMD best management practices (BAAQMD 2022) listed in **Mitigation Measure AIR-1** to reduce cumulative construction dust impacts. The project would not result in an exceedance of national or State ambient air quality standards and impacts would be less than significant with incorporation of the BAAQMD basic best management practices for construction-related fugitive dust emissions listed in **Mitigation Measure AIR-1**.

Operations

The pipeline and multi-use pathway would not be associated with substantial long-term energy usage or additional operation and maintenance activities. Inspection and maintenance of the pipeline would be incorporated into the City's existing operation and maintenance activities and would not require additional vehicle trips. Lighting would be installed at the multi-use pathway, but would be powered by Sonoma Clean Power (SCP) (see Section 3.6 Energy for further information about SCP). Thus, no new emissions would be associated with operation of the proposed project and impacts would be less than significant.

Mitigation Measures

BAAQMD best management practices listed below would be implemented to ensure that cumulative construction dust impacts are less than significant.

Mitigation Measure AIR-1. Best Management Practices for Construction-Related Fugitive Dust Emissions. The City shall ensure the construction contractor implements the following measures during construction for the proposed project to have a less-than-significant criteria air pollutant impact related to construction-related fugitive dust emissions.

- BMP 1: All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- BMP 2: All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- BMP 3: All visible mud or dirt trackout 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.
- BMP 4: All vehicle speeds on unpaved roads shall be limited to 15 mph.
- BMP 5: 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.
- BMP 6: All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
- BMP 7: All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
- BMP 8: Unpaved roads providing access to sites located 100 feet or further from a paved road shall be treated with a 6- to 12-inch layer of compacted wood chips, mulch, or gravel.
- BMP 9: Publicly visible signs shall be posted with the telephone number and name of the person to contact at the City of Petaluma regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD General Air Pollution Complaints number (1-800-334-6367) shall also be visible to ensure compliance with applicable regulations.

Significance Determination

Less than significant with mitigation incorporated.

c) Expose sensitive receptors to substantial pollutant concentrations?

In its General Plan 2025, the City of Petaluma describes sensitive receptors as, "facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly and people with illnesses. Examples include schools, hospitals and residential areas." Heightened sensitivity may be caused by health problems, proximity to the emissions source, and duration of exposure to air pollutants. Any residence can also be considered a sensitive receptor. The City recognizes sensitive members of the community are also likely to be at parks and in or around any residential area (City of Petaluma 2008).

The project is located adjacent to industrial, commercial, residential, recreational, and educational land uses. Residential and educational land uses are sensitive receptors that could be affected by air quality emissions during construction. Residential uses are as close as 25 feet to 100 feet from proposed pipeline segments along Baywood Drive, Casa Grande Road, and Technology Lane. Educational uses in the project vicinity include River Montessori Charter School, approximately 50 feet from the pipeline segment at 3880 Cypress Drive. These receptors would also be sensitive to construction noise. Refer to **Figure 3-2** in the Noise analysis for an illustration of the sensitive receptor locations relative to the project.

Construction Emissions

The project would result in short-term construction related emissions as close as 25 feet from residences. However, all emissions would be below the regional thresholds (see **Table 3-3**). The CAAQS and NAAQS provide public health protection, including protecting the health of sensitive populations such as asthmatics, children, and the elderly. A project that is consistent with the latest adopted clean air plan and does not exceed the BAAQMD significance thresholds can be assumed to not have a substantial adverse impact on public health. The project would conform with BAAQMD Regulation 6, Rules 1 and 6, and BAAQMD best management practices for construction-related fugitive dust, which control fugitive emissions of particulate matter, by requiring measures such as watering of exposed soils, watering unpaved construction roads, limiting vehicle speeds on unpaved areas, and sweeping paved roads be implemented during construction (see **Mitigation Measure AIR-1**). Furthermore, the construction fleet contracted for the proposed project would be required to comply with the CARB In-Use Off-Road Diesel-Fueled Fleets Regulations, which would limit vehicle idling time to five minutes, restrict adding vehicles to construction fleets with older-tier engines, and establish a schedule for retiring older, more polluting engines from the construction fleet. As explained under "a" and "b" above, it would not conflict with the Bay Area Clean Air Plan or exceed the BAAQMD significance thresholds.

In addition, the duration of activity at any given receptor would be relatively short. Construction of the pipelines would progress at a rate of approximately 100 feet per day. Thus, exposure to air pollution emissions at any one location would be limited to a period of 3 to 5 days and residential receptors would experience peak construction emissions for less than two weeks. Given the relatively short duration of impacts at any given receptor, and that the project would not generate significant construction emissions above the regional thresholds with incorporation of **Mitigation Measure AIR-1**, it is unlikely that project emissions from construction would expose sensitive receptors to substantial pollutant concentrations.

However, during construction, soil disturbance has the potential to release dust and particulate matter in the vicinity of residences and at least one school. Because construction would occur as close as 25 feet from residences and 50 feet from a school, the City would incorporate **Mitigation Measure AIR-2**, enhanced best management practices for construction-related fugitive dust. BAAQMD strongly encourages (BAAQMD 2022) lead agencies to incorporate these measures into their projects when construction would occur close to schools, residential areas, or other sensitive land uses. With **Mitigation Measures AIR-1** and **AIR-2**, construction related impacts would be less than significant.

Operations

According to the BAAQMD CEQA Guidelines (BAAQMD 2022), common operational sources of TACs and $PM_{2.5}$ include gasoline stations, dry cleaners, diesel backup generators, freeways, and construction sites, while CO hotspots tend to occur at intersections with greater than 44,000 vehicles per hour. The project, as a sealed, underground alternative conveyance for wastewater, would not introduce such sources or activities in the long-term. Instead, regular operation and maintenance activities would consist of the inspection and repair, as necessary, of pipeline and maintenance access structures and the multi-use pathway. These activities would only be required on an intermittent basis and would result in a minor increase in air pollution emissions from vehicles in the project vicinity. Thus, the proposed project would not result in an increase in operational emissions that could lead to CO hotspots or emissions of TACs or hazardous air pollutants. Therefore, sensitive receptors would not be subjected to substantial pollutant concentrations and impacts would be less than significant.

Mitigation Measures

See **Mitigation Measure AIR-1 Best Management Practices for Construction-Related Fugitive Dust Emissions**, as described above.

BAAQMD enhanced best management practices listed below would be implemented to ensure that construction close to schools, residential areas or other sensitive land uses do not result in significant effects on sensitive receptors.

> **Mitigation Measure AIR-2 Enhanced Best Management Practices for Construction-Related Fugitive Dust Emissions.** The City shall ensure the construction contractor implements the following measures during construction when soil disturbing activities occur within 100 feet of schools, residential areas, or other sensitive land uses for the proposed project to have a less-than-significant air quality impact on sensitive receptors related to construction-related fugitive dust emissions.
>
> - EBMP 1: Limit the simultaneous occurrence of excavation, grading, and ground-disturbing construction activities.
> - EBMP 2: Install wind breaks (e.g., trees, fences) on the windward side(s) of actively disturbed areas of construction. Wind breaks should have a maximum of 50 percent air porosity.
> - EMMP 3: Plant vegetative ground cover (e.g., fast-germinating native grass seed) in disturbed areas as soon as possible and water appropriately until vegetation is established.
> - EBMP 4: Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.

- EBMP 5: Minimize the amount of excavated material or waste materials stored at the site.
- EBMP 6: Hydroseed or apply non-toxic soil stabilizers to construction areas, including previously graded areas, that are inactive for at least 10 calendar days.

Significance Determination

Less than significant with mitigation incorporated.

d) Result in other emissions (such as those leading to odors or adversely affecting a substantial number of people)?

Examples of facilities commonly known to generate objectionable odors include wastewater treatment plants, sanitary landfills, composting/green waste facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting/coating operations, rendering plants, and food packaging facilities (CARB 2005). The proposed project would involve emissions of sulfur compounds from use of oil and diesel fuel during construction, which would potentially result in unpleasant odors. Construction would be temporary and odorous emissions from construction equipment tend to dissipate quickly within short distances from construction sites.

Once the proposed project is operational, the sewer pipeline would not be associated with substantial odors because it would contain wastewater flows underground. The pipeline has air release valves along its length, which facilitate the release of accumulated air in the headspace of the pipe into the maintenance access structures along the pipeline. When the maintenance access structures are opened, the air release valves would have the potential to release odorous gases in the immediately surrounding area. However, odors would likely be detected primarily from inside the maintenance access structure by staff conducting inspections or maintenance tasks. There is also potential for some release of odors if maintenance requires the pipeline to be drained, in which case wastewater would be conveyed from blow-off structures to the nearest gravity sewer. Maintenance activities may thus involve release of odors from open maintenance access structures; however, maintenance would be short-term, as-needed, and limited in extent. Odors would dissipate quickly within short distances, and thus would not produce odors that affect a substantial number of people. A multi-use pathway is not a land use type typically associated with long-term odors. Impacts would be less than significant.

Mitigation Measures

None required.

Significance Determination

Less than significant.

3.4 Biological Resources

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

other approved local, regional, or state
habitat conservation plan?

Discussion

No previous biology survey reports were available for the project alignment. Data sources that assisted in this analysis include:

- U.S. Geological Survey (USGS) 7.5-minute topographic maps (Petaluma Creek and surrounding 8 quadrangles)
- Historic and current aerial imagery (Google 2023)
- California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB) (CDFW 2023a), Natural Communities List (CDFW 2023b), and California Essential Habitat Connectivity database (CDFW 2023c)
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS 2023); and
- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPac) Species List (USFWS 2023a).
- National Wetlands Inventory database (USFWS 2023b)

Biologist Liza Ryan surveyed the proposed parallel force main and multi-use path alignments August 2, 2022, and June 14, 2023 to characterize vegetation communities and to evaluate the study area for potential to support special-status wildlife and plant species, and assess the potential presence of sensitive natural communities. Botanist Nicole Ibanez conducted an aquatic resources delineation on June 14, 2023; wetlands and waters within the survey area were mapped (see Figures 1 and 2a-e in **Appendix C**). The survey area is defined as a 150- to 200-foot buffer zone along the project alignment where potential direct or indirect impacts may occur. Along most of the parallel force main alignment, the study area is 150 feet (75 feet on each side of the alignment) with the exception of the segment where the multi-use path would be constructed. In this segment, the study area is 200 feet, or 100 feet on either side of the parallel force main alignment.

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

Several species known to occur in the vicinity of the proposed project are protected pursuant to federal and/or state endangered species laws, or have been designated as Species of Special Concern by CDFW. In addition, Section 15380(b) of the CEQA Guidelines provides a definition of rare, endangered, or threatened species that are not included in any listing. Species recognized under these terms are collectively referred to as "special-status species."

A list of special-status species with potential to occur in or near the project area was compiled from a nine-quad search of the CNDDB (CDFW 2023a) centered on the USGS 7.5-minute quad Petaluma River; a nine-quad search on the CNPS Rare Plant Inventory (CNPS 2023); and a search of the USFWS IPaC database (USFWS 2023a). The full list of species was then individually assessed based on habitat requirements and distribution relative to vegetation community that occur in and around the project area as well as the observations made during the reconnaissance survey. Special-status plant and wildlife species considered in the analysis are described in **Appendix C** (Biological Resources Report). Species present or having a moderate or high potential to occur in the alignment are described below in greater detail.

One special-status species, San Pablo song sparrow (*Melospiza melodia samuelis*), was observed during the biological reconnaissance survey. Suitable habitat for the song sparrow, saltmarsh common yellowthroat (*Geothylpis trichas sinuosa*), and other marsh birds was observed within the marshlands, and suitable habitat for bats, including special-status bats, was present in the riparian woodland along Adobe Creek. Protected migratory bird species may also nest along the alignment, including mourning dove (*Zenaida macroura*), dark-eyed junco (*Junco hyemalis*), and American crow (*Corvus brachyrhynchos*).

Special-Status Plants

Special-status plants that have been recorded in the vicinity are listed in **Appendix C**. The majority of the alignment consists of non-native grassland and disturbed land (e.g., parking lots). The fragmentary riparian and marsh habitats along the alignment have been subject to human disturbance and hydrological changes over the years. As a result, habitat for special-status plant species is poor quality and no rare plants are likely to occur along the alignment. Portions of Shollenberger Park that are not near the Project provide potential habitat for special-status plants such as Point Reyes bird's beak (*Chloropyron maritimum* ssp. *Palustre*), but no special-status plants have been observed, nor are expected to occur, along the alignment or within the buffer zone depicted in Figures 1 and 2a-e in **Appendix C**.

Special-Status Wildlife

Several special-status wildlife species were determined to have a moderate or higher potential to occur in the vicinity of the alignment are discussed below. These species could be found within suitable habitat in Shollenberger Park, Adobe Creek, and Petaluma Marsh in the vicinity of the alignment and buffer area, and are discussed below.

<u>Steelhead (*Oncorhynchus mykiss irideus*)</u>
The Central California Coast steelhead distinct population segment is federally listed as threatened. This distinct population segment includes those fish found in coastal river basins from the Russian River south to Soquel and Aptos Creek, California, and the drainages of San Francisco Bay and San Pablo Bay, including the Napa River. Steelhead may be residents (non-migratory, often referred to as "rainbow trout") or may migrate to the open ocean (anadromous). Adult steelhead lay eggs and juveniles rear in freshwater until they become large enough to migrate to the ocean. Steelhead spawning sites contain gravel substrate and have sufficient flow velocity to maintain circulation through the gravel and provide a clean, well-oxygenated environment for incubating eggs. Steelhead fry generally rear in edgewater habitats and move gradually into pools and riffles as they grow larger. Vegetative cover is important for juvenile steelhead, as a velocity refuge and to avoid predation. Steelhead are seasonally present in the lower portions of Adobe Creek, including where the alignment would cross. Adobe Creek is designated critical habitat for steelhead, but the species would only be present during winter months when the channel is flowing.

<u>California red-legged frog (*Rana draytonii*)</u>
The California red-legged frog is federally listed as a threatened species throughout its range in California and is a CDFW Species of Special Concern (SSC). This frog historically occurred over much of the state from the Sierra Nevada foothills to the coast and from Mendocino County to the Mexican border. California red-

legged frogs typically breed in ponds, slow-moving creeks, and streams with deep pools that are lined with dense emergent marsh or shrubby riparian vegetation. In summer (non-breeding season), California red-legged frogs are likely to be observed near a deep pool in a creek or a pond, where emergent vegetation, semi-submerged root masses and undercut banks provide protection from predators (USFWS 2005). They use upland habitat such as open grasslands for dispersal or foraging for invertebrate prey. Suitable upland habitat includes moist seeps or springs, burrows or moist debris piles for dispersal and aestivation. Factors that have contributed to the decline of this species include destruction of riparian habitat from development, agriculture, flood control practices, and introduction of exotic predators such as American bullfrog (*Lithobates catesbeianus*). The nearest California red-legged frog observation to the alignment was made in 1994 in Ellis Creek near Petaluma Marsh, within 1.0-mile of the alignment. While California red-legged frogs are known to disperse up to 1.0-mile or more from suitable breeding ponds, there are no records of the species in Adobe Creek, and the waters at Shollenberger Park are often brackish and unsuitable for this species. There is moderate potential for California red-legged frog to disperse through the ECWRF area of the alignment during wetter periods, but ponds in this area are perennial and support a large population of bullfrog, a predator and competitor species. Thus, California red-legged frog is unlikely to colonize these ponds from their known habitat in nearby Ellis Creek.

Foothill yellow-legged frog (*Rana boylii*)

The Northwest/North Coast population of foothill yellow-legged frog is a CDFW species of special concern. Foothill yellow-legged frog inhabits partly-shaded, usually perennial, streams with rocky substrate, deep pools and shallow riffles, and sunny, sandy or rocky banks for basking. Breeding occurs between mid-March and early June. Foothill yellow-legged frogs attach eggs to available substrate in the stream bed, often stones or emergent vegetation such as sedges. Frog larvae need at least 15 weeks to attain metamorphosis, which lasts a few days or weeks, and during which metamorphs are concentrated in great numbers along the shore of the stream. Newly metamorphosed juveniles typically remain in the stream and migrate upstream from the hatching site. Conservation threats include damming of rivers or otherwise reducing spring water flows and/or periodic water releases during the breeding season, which shears eggs from their attachment site and washes them or newly hatched larvae downstream. The nearest observation of this species is upstream in Adobe Creek in 2019, approximately ½-mile from the alignment crossing. Though the creek does not have suitable habitat for this species at the alignment crossing, it has moderate potential to occur in the area during wet times of year only.

Western pond turtle (*Emys marmorata*)

Western pond turtle is a CDFW Species of Special Concern and has been proposed for federal listing. This species is normally associated with permanent ponds, lakes, streams, irrigation ditches, or permanent pools along intermittent streams and requires basking sites and suitable upland habitat, such as sandy banks, for egg laying. This species can tolerate full-strength seawater for a short period of time, but normally is found in freshwater. Western pond turtle was recorded in Ellis Creek in 2007 and in Shollenberger Park in 2008; adults were observed basking on woody debris. This species has high potential to occur along the alignment in Shollenberger Park or Ellis Creek segments where water channels, ponds, woody debris, or other basking sites are present. Nearby grassland habitat could also provide marginal nesting habitat for this species.

Ridgway's rail and California black rail (*Rallus obsoletus* and *Laterallus jamaicensis coturniculus*)

Ridgway's and California black rail are secretive birds difficult to observe in dense marsh vegetation; they prefer to run and hide rather than fly from threats. Ridgway's rail maintains large home ranges in tidal and brackish marshes and has high site fidelity. Ridgway's rails occur within a range of tidal and brackish marshes; the qualities of a marsh strongly influence the density of rail population it can support. Physical habitat characteristics positively correlated to California clapper rail presence include large marsh size, proximity to other marshes, presence of high tide refugia, presence of buffers or transitional zones between marshes and upland areas, diverse marsh elevations, and intricate channel networks (USFWS 2013).

California black rail may inhabit saltwater, brackish, and freshwater marshes. Vegetation of occupied marshes varies from almost pure pickleweed to sedges, saltgrass, bulrush and cattails; it prefers saturated ground in shallow marsh for nesting. Black rail and Ridgway's rail have been recorded numerous times in the past 10 to 15 years in marshes along the Petaluma River and in San Pablo Bay. The closest black rail record is in Petaluma Marsh within 1,000 feet of the alignment in 2015, within Shollenberger Park (CDFW 2022). Ridgway's rail's closest record was in 2014 in the Petaluma Marsh adjacent to Shollenberger Park, north of the Petaluma River (CDFW 2023a). This location is within 1/4-mile of the alignment and overlaps the recorded location for black rail; while these species would not occur on the alignment itself, both species are assumed to be present in the marshes south of the alignment, east of U.S. Highway 101.

<u>Breeding and migratory birds</u>
The riparian woodland, freshwater marsh and grassland communities along the alignment may provide nesting and foraging habitat for a variety of resident and migratory birds in mature trees, dense shrubs, or in tall weedy plants on the ground. Raptors that may nest in riparian trees include white-tailed kite (*Elanus leucurus)*, a California Fully Protected species, or Cooper's hawk (*Accipiter cooperii)* on the federal Watch List. In addition, great horned owl (*Bubo virginianus*) may nest in these areas, while passerine species could include Anna's hummingbird (*Calypte anna*), Bewick's wren (*Thryomanes bewickii*), American robin (*Turdus migratorius*), American crow, spotted towhee (*Pipilo maculatus*), dark-eyed junco and western meadowlark (*Sturnella neglecta)*, among others. The federal Migratory Bird Treaty Act (MBTA) and California Fish and Game Code protect nesting raptors and native migratory birds that could occur along the alignment and/or in the vicinity.

Birds such as San Pablo song sparrow, marsh wren (*Cistothorus palustris)* and salt marsh common yellowthroat, may nest in the low and high marsh, along with shorebirds and waterbirds, including dabbling ducks, that would also use adjacent lowland grassland habitats.

<u>Salt marsh harvest mouse</u> (*Reithrodontomys raviventris)*
The salt marsh harvest mouse is a small rodent in the family Muridae, morphologically similar to the more widespread western harvest mouse (*Reithrodontomys megalotis*). As described in the species' Recovery Plan (USFWS 2013), the fringing tidal marshes along northern San Pablo Bay (Petaluma River to Mare Island Strait) support the largest population of the northern subspecies of salt marsh harvest mice in San Pablo Bay. Salt marsh harvest mice commonly occur in the upper portions of tidal marshes where terrestrial grasses are absent or remote. However, salt marsh harvest mice frequently utilize terrestrial grassland habitats adjacent to tidal marsh and grass-pickleweed ecotones. Salt marsh harvest mice are typically associated with tall, dense, continuous stands of pickleweed, but may also be found in upper marsh stands of other vegetation. Salt marsh harvest mouse has been recorded in Petaluma Marsh (1990) along the Petaluma River (CDFW 2023a), but would not be expected along the alignment itself, which is approximately 500 feet from tidal marsh habitat.

<u>Bat species</u>
Bats are likely to forage over grassland and marsh habitats and may roost overnight in tree cavities or underneath bark. Two special-status bats, Townsend's big-eared bat (*Corynorhinus townsendii*) and hoary bat (*Lasiurus cinereus*) are moderately likely to occur, along with more common bat species such as *Myotis*

bats. Bats would be most likely to roost in coast live oak (*Quercus agrifolia*) trees within the riparian woodland surrounding Adobe Creek.

PIPS Parallel Force Main

Impacts to Steelhead

Adobe Creek is critical habitat for **steelhead,** which may be present in its waters connecting to the Petaluma River in winter months when the channel flows. Although this creek would be crossed by microtunneling, steelhead in the stream could inadvertently be harmed by increased turbidity from sediment deposits in water, or by exposure to drilling fluids. To avoid impacts to steelhead, work would be performed with appropriate approvals from regulatory agencies, and would be restricted seasonally as specified in **Mitigation Measure BIO-1a**.

Impacts to Terrestrial Species

Portions of Adobe Creek, Petaluma Marsh, Shollenberger Park and ECWRF lands along the parallel force main have potential habitat for California red-legged frog, foothill yellow-legged frog, and western pond turtle, and Shollenberger Park and Petaluma Marsh have potential habitat for salt marsh harvest mouse. If individual terrestrial wildlife, including **California red-legged frog, foothill yellow-legged frog**, **western pond turtle**, and **salt marsh harvest mouse**, were to be present in the work area, they could be injured or killed by workers or equipment, or become trapped in trenches. Because of the presence of habitat, these species are assumed to be present. To avoid impacts to these special-status species, **Mitigation Measure BIO-1b** would be implemented:

Impacts to Rails

Nesting **Ridgway's rail** and **California black rail** may be present within the marshlands of Petaluma Marsh and Shollenberger Park and could abandon their nests if disturbed by loud noise or other disruption from nearby work activities. The part of the parallel force main alignment between Marina Avenue and Casa Grande Road (i.e., parallel to the multi-use pathway route) is within 700 feet of tidal marsh suitable for rail nesting. To avoid disturbance to nesting rails, **Mitigation Measure BIO-1c** would be implemented:

Impacts to Migratory Birds

Nesting migratory birds may use riparian woodland, freshwater marsh and grassland habitats to construct nests in trees, shrubs or tall grasses. The highly developed surroundings and the limited number of trees and shrubs present in the project area reduces the likelihood for common birds to nest in developed lands; however, migratory birds acclimatized to human presence and noise could also use ornamental vegetation for nesting. Nesting birds, eggs and young could be harmed or killed if vegetation containing a nest is removed during construction. Nesting birds could also abandon their eggs or young if disturbed by noise, human presence, or equipment traffic. If construction activities are scheduled to occur during the bird nesting season (February 1 through August 31), the City or its contractor shall implement **Mitigation Measure BIO-1d** to reduce potential impacts to migratory birds and nesting raptors:

Impacts to Bats

Bats may roost in large trees with cavities, especially near water where insect prey is abundant. The riparian woodland near Adobe Creek has mature trees suitable for bat roosting. If tree removal is required for pipeline installation, roosting bats could be harmed or killed. To reduce potential impacts on bats, including special-status bat species**, Mitigation Measure BIO-1e** shall be implemented:

Mitigation Measures:

To avoid impacts to candidate, sensitive, or special status species, work would be performed with appropriate approvals from regulatory agencies, and would be mitigated as follows:

To avoid impacts to candidate, sensitive, or special status species, work would be performed with appropriate approvals from regulatory agencies, and would be mitigated as follows:

Mitigation Measure BIO-1a. Steelhead. To avoid impacts to steelhead, crossing of Adobe Creek shall be conducted in the dry season and work shall be performed with appropriate approvals from the National Marine Fisheries Service as well as other applicable state and federal agencies, and the City and contractors shall comply with all required permit conditions for microtunneling at Adobe Creek. No work will be conducted within 100 feet of Adobe Creek, and work areas within 200 feet of Adobe Creek shall be bordered by temporary exclusion fencing.

Mitigation Measure BIO-1b. Terrestrial Species. To avoid impacts to western pond turtle, foothill yellow-legged frog, California red-legged frog, or salt marsh harvest mouse, if present, ground disturbance to marsh habitat (including emergent vegetation such as bulrush and cattails) will be avoided to the extent feasible.

Work areas within 200 feet of potential habitat for western pond turtle, foothill yellow-legged frog, California red-legged frog, and salt marsh harvest mouse shall be bordered by temporary exclusion fencing. The fence shall be made of a smooth material that does not allow mice to climb or pass through, of a minimum above-ground height of 30 inches, and the bottom shall be buried to a depth of at least 6 inches so that mice cannot crawl under the fence. Installation of the fence shall be monitored by an approved biologist with experience with these species, who will check the fence alignment prior to vegetation clearing and fence installation to ensure no sensitive species are present.

Where marsh habitat cannot be avoided, vegetation shall be removed from the ground disturbance work area, plus a 10-foot buffer around the area, with mechanized hand tools or by another method approved by the USFWS and CDFW. Vegetation height shall be maintained at or below 5 inches above ground. Vegetation removal in wetland habitat shall be conducted under the supervision of a qualified biologist. If impacts cannot be avoided an Incidental Take Permit shall be obtained from CDFW.

Mitigation Measure BIO-1c. Rails. To avoid disturbing nesting Ridgway's rail and California black rail the following measure shall be implemented:

- Prior to construction, protocol-level surveys shall be conducted in all suitable habitat for Ridgway's (California clapper) rail or California black rail, following the methods detailed in the USFWS *Site-Specific Protocol for Monitoring Marsh Birds* (2017). No work activities, visual disturbance (direct line of sight) and/or increase in the ambient noise level shall occur within 700 feet [215 meters] of areas where rails have been detected and are likely to be nesting during the breeding season (January 15 – August 31), or a distance determined in coordination with U.S. Fish and Wildlife [USFWS] or the California Department of Fish and Wildlife [CDFW]).

- If surveys are not conducted, nesting rails shall be assumed present in suitable marsh habitat adjacent to the alignment and proposed multi-use path, and mitigation described above shall be implemented.
- As the California black rail, Ridgway's rail and salt marsh harvest mouse are all California fully protected species, as well as state and/or federal listed species, the City shall avoid all take of these species, by implementing the mitigation described above requiring avoidance of all work within 700 feet of areas where rails have been detected or, if surveys are not conducted, where habitat is present.

Mitigation Measure BIO-1d. Nesting Birds. If construction is scheduled to start during the bird nesting season (February 1 through August 31), no more than two weeks prior to construction in a given area, a qualified biologist shall perform preconstruction surveys for nesting birds within 250 feet of construction areas, where access is available. If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further avoidance is required.

If active nests are detected during preconstruction surveys, workers shall create a no-disturbance buffer around active raptor nests and nests of other special-status birds during the breeding season, or until it is determined that young birds have fledged. Buffers shall be at least 250 feet for raptors and at least 150 feet for other nesting birds. Nests initiated within the active construction area may have reduced buffer sizes due to the increased tolerance of disturbance. Reductions to nest buffer distances may be allowed on a case-by-case basis in coordination with the CDFW based on site-specific factors such as the existing disturbance levels, the species of nesting bird, and the magnitude of the proposed disturbance. A lapse of greater than 10 days in construction activity shall trigger the need for additional nesting bird surveys.

Mitigation Measure BIO-1e. Bats. Before any ground-disturbing activity, a qualified biologist shall conduct surveys of all potential bat habitat, including areas suitable for maternity roosts and/or winter hibernacula. Surveys of potential bat habitats shall be conducted within 2 weeks prior to construction. Removal or trimming of trees or demolition of buildings showing evidence of bat hibernation or maternity activity shall occur during the period least likely to affect inactive wintering bats and active bat maternity roosts (i.e., avoid roost disturbance from October 15 to February 15 for winter hibernacula, and April 15 to August 15 for maternity roosts). Tree removal or demolition may occur during sensitive bat roosting periods if a qualified bat biologist confirms the absence of overwintering habitat or maternity roosts. If active day or night (non-maternity) roosts are found, the bat biologist shall supervise tree removal or building demolition over two days, in order to allow individual bats to depart prior to tree removal or building demolition. If bats are found the City will report occurrences to CDFW.

Multi-Use Pathway

Terrestrial wildlife, including **western pond turtle** and **salt marsh harvest mouse,** also have potential to be present along the route of the multi-use pathway. If these species were to be present in the work area, they could be injured or killed by workers or equipment, or become trapped. To avoid impacts to these special-status species, if present, **Mitigation Measure BIO-1b. Terrestrial Species** would be implemented to reduce impacts to a less-than-significant level.

Nesting **Ridgway's rail** and **California black rail** may also be present within the marshlands of Petaluma Marsh near the multi-use pathway route and could abandon their nests if disturbed by loud noise or other disruption from nearby work activities. The multi-use pathway route on the alignment is within 700 feet of tidal marsh suitable for rail nesting. To avoid disturbance to nesting rails, **Mitigation Measure BIO-1c. Rails** would be implemented to reduce impacts to a less-than-significant level.

Furthermore, migratory birds may use portions of the Petaluma Marsh along the proposed multi-use path for nesting and **Mitigation Measure BIO-1d** would be implemented to reduce impacts on these species to a less-than-significant level. No bat roosts have potential to be disturbed by multi-use pathway construction, as there are no suitable roost trees in this area.

Significance Determination

Less than significant with mitigation incorporated.

b) Have a substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plan, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Natural communities are assemblages of plant species that occur together in the same area and are defined by species composition and relative abundance. Natural community classification is based on field observations, and the standard list of California Terrestrial Natural Communities recognized by the California Natural Diversity Database (Holland 1986). Figure 2(a-e) in **Appendix C** shows wetlands and riparian habitat present along the alignment. Developed/disturbed land is also present, but is not considered a vegetation community. Habitat types identified within the survey area include non-native annual grassland, riparian woodland, seasonal wetland and freshwater marsh. Shollenberger Park supports seasonal wetlands, freshwater marsh channels, and brackish marsh ponds. These areas are generally more saline nearer to the tidally influenced Petaluma River, which is lined with tidal marshlands. Brackish and tidal marshlands do not overlap the alignment. Sensitive communities within the alignment include riparian woodland and freshwater marsh. Each habitat type within the alignment is described below.

Riparian woodland occurs along Adobe Creek where the PIPS parallel force main alignment crosses (see Figure 2c in **Appendix C**). There are 0.25 acres of perennial channel, 0.62 acres of intermittent channel and 0.05 acres of ephemeral channel in the project area. The overstory trees include California bay laurel (*Umbellularia californica*), California live oak, willow (*Salix* sp.), valley oak (*Quercus lobata)* and big-leaf maple (*Acer macrophyllum*). The understory vegetation includes non-native grasses, and other primarily non-native plants including Himalayan blackberry, fennel (*Foeniculum vulgare*), Italian thistle (*Carduus pycnocephalus*), and English ivy (*Hedera helix*). Wildlife species common to riparian woodland include Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), warbling vireo (*Vireo gilvus*), Bewick's wren, orange-crowned warbler (*Oreothlypis celata*), black phoebe (*Sayornis nigricans*), and red-shouldered hawk (*Buteo lineatus*). Common and special-status bats may also roost in tree cavities or beneath the bark of mature trees. Terrestrial mammals such as deer mouse (*Peromyscus* sp.), may also reside in the woodland understory.

Seasonal Wetland occurs in the project area where water ponds for long enough to support hydrophytic vegetation in swales and depressions. These features are classified as *Palustrine, Emergent, Persistent,* or *Seasonally Flooded* (Cowardin, 1979). They are primarily isolated freshwater features fed by rainwater and runoff. Figure 2 in **Appendix C** shows seasonal wetlands south of the railroad, in swales within annual grassland south of developed areas, and in a depression southwest of the wastewater treatment ponds. These wetlands have hydric soils, are seasonally flooded, and are dominated by hydrophytic vegetation such as fat-hen (*Atriplex prostrata*), cocklebur (*Xanthium strumarium*), nutsedge (*Cyperus eragrostis*), bristly ox tongue (*Helminthotheca echioides*), Italian rye grass and annual beard grass (*Polypogon monspeliensis*). Seasonal wetlands may host a variety of nesting birds, reptiles and small mammals, similar to riparian habitats. See item c for an enumeration of the acreage of wetland habitats in the project area.

PIPS Parallel Force Main

During construction, riparian woodland habitat at Adobe Creek (see Figure 2c in **Appendix B**), is planned to be crossed via microtunneling with access shafts located outside riparian habitat. Seasonal wetland may be crossed at both eastern and western ends of the alignment (see Figure 2a and 2e in **Appendix B**). Damage to any riparian habitat during construction would be potentially significant. . Refer to item c for a discussion of impacts to wetlands.

Mitigation Measures:

Implementation of the following mitigation measures would reduce impacts of the parallel force main construction on sensitive habitats to a less-than-significant level by avoiding or minimizing impacts to riparian and wetland habitat, and by restoring all temporarily impacted riparian and wetland habitat using native species

> **Mitigation Measure BIO-2. Minimize Impact to Wetlands and Riparian Woodlands.** Wetlands, waters and riparian areas shall be avoided to the greatest extent feasible during project construction of the pipeline and multi-use path. Before construction begins, the project engineer and a qualified biologist shall identify locations for equipment and personnel access and materials staging that will minimize sensitive vegetation disturbance. When heavy equipment is required, unintentional soil compaction shall be minimized by using equipment with a greater reach or using low-pressure equipment. Temporary and permanent impacts on sensitive natural communities, including wetlands and riparian woodlands, from construction of the pipeline and multi-use path shall be mitigated by revegetation with native species as described in **Mitigation Measures BIO-3a** and **3b**.
>
> Vegetation management activities would be limited to areas outside of marshland and riparian habitat to the greatest extent possible. For vegetation management activities adjacent to wetland or riparian habitat, the only herbicides to be used would be EPA-certified for use in/adjacent to aquatic environments.
>
> **Mitigation Measure BIO-3a. Habitat Restoration and Monitoring** Before the start of construction, the City shall prepare a Habitat Restoration and Monitoring Plan that provides for the restoration of any impacted riparian or wetland habitat. If no direct impacts are anticipated to wetland or riparian woodland habitats, then no such plan would be required. The plan shall describe required salvage and replanting protocols prior to and after construction is complete and shall thereby reduce the long-term amount of losses of these natural communities. This plan shall include, but not be limited to, protocols for replanting of vegetation removed prior to or during construction, and management and monitoring of the plants to ensure replanting success pursuant to requirements included in permits issued for the project.

The plan shall specify monitoring and performance criteria for the species planted, invasive species control criteria, as well as the best time of year for seeding to occur, pursuant to requirements of permits from the various resource agencies with regulatory purview over the project. Revegetated areas shall be monitored for a five-year period after planting to track progress toward performance criteria.

Native riparian vegetation within the project construction footprint shall be salvaged prior to construction and replanted after construction is completed. Areas impacted by construction-related activity shall be replanted or reseeded with native trees, shrubs, and herbaceous perennials and annuals from the watershed under guidance from a qualified biologist. Local plant materials shall be used for revegetation of the disturbed area. The plant materials shall include local cuttings from the local watershed or from adjacent watersheds.

The Habitat Restoration and Monitoring Plan shall also address restoration of jurisdictional wetlands and waters. Temporary impacts to wetlands shall be restored on site with native wetland species under guidance from a qualified biologist. Permanent impacts to jurisdictional wetlands shall be mitigated by replacement on- or off-site at an equal ratio or whatever more stringent requirements are included in the permits to be issued for the project.

The plan shall contain vegetation management protocols, protocols for monitoring replanting success (e.g., 70 percent plants in good condition) and an adaptive management plan if success criteria are not being met. The adaptive management plan shall include interim thresholds for replanting success and alternative management approaches, such as weed control, additional replanting, or extending the monitoring term to undertake if thresholds are not met.

Mitigation Measure 3b. Permanent Impacts Any permanently impacted riparian or wetland acreage shall be mitigated by compensatory mitigation, with replacement of like habitat on- or off-site, at a 1:1 ratio, and in accordance with specifications of applicable regulatory agency permits).

Multi-Use Pathway

No riparian or other sensitive natural community is present along the proposed route for the multi-use pathway. For potential impacts to wetlands and waters, see section c).

Significance Determination

Less than significant with mitigation incorporated.

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

The PIPS Aquatic Delineation (ESA 2023) identified approximately 2.4 acres of wetlands and 2.1 acres of jurisdictional waters in the study area, which includes the project alignment and a 75-foot buffer on each side of the pipeline-only segments and a 100-foot buffer along the segment where the multi-use path would be constructed (Figure 2a-e in **Appendix C**). Wetland types identified included Freshwater Emergent Wetland, Saline Emergent Wetland, and Seasonal Wetland. Open waters included intermittent, ephemeral & perennial channels; ponds; and a ditch. The ponds are located at the eastern end of the alignment on ECWRF lands. Crossing Shollenberger Park, the alignment contains an intermittent channel and freshwater emergent wetland within its study area. The multi-use path route contains a drainage channel with saline wetland along its sides, and two small seasonal wetlands. Estuarine and seasonal wetlands are also present at the western end of the alignment near McDowell Creek.

Freshwater Emergent Wetland within Shollenberger Park is dominated by dense cattails and tules, and likely holds water most of the year, with species including hardstem bulrush (*Schoenoplectus acutus*), cattail (*Typha* sp.), and panicled bulrush (*Scirpus microcarpus*).

Saline Emergent Wetland occurs in narrow strips adjacent to both sides of the perennial, tidal waters on the west side of the alignment and either side of McDowell Creek, dominated by pickleweed (*Salicornia pacifica*), saltgrass (*Distichlis spicata*), curly dock (*Rumex crispus*), Italian rye grass (*Festuca perennis*), and fat hen (*Atriplex prostrata*).

Seasonal Wetland is present in patches near the western end of the alignment and in the ECWRF area. In these locations water ponds seasonally for long enough to support hydrophytic vegetation in swales and depressions, receiving runoff from precipitation and upland areas nearby. These wetlands are dominated by hydrophytic vegetation such as fat-hen (*Atriplex prostrata*), cocklebur (*Xanthium strumarium*), nutsedge (*Cyperus eragrostis*), bristly ox-tongue (*Helminthotheca echioides*), Italian rye grass and annual beard grass (*Polypogon monspeliensis*).

Open Waters are present in Adobe and McDowell Creeks, and other unnamed intermittent and ephemeral channels. Settling ponds are also present in the ECWRF area and support numerous waterfowl. While these features occur within the study buffer, the project would avoid impacts to these features.

PIPS Parallel Force Main

Installation of the pipeline along the alignment would require crossing saline, freshwater and seasonal wetlands, as well as open water channels such as McDowell Creek and unnamed ephemeral or intermittent channels, resulting in temporary impacts to these features during construction. No permanent impacts to wetlands are expected from pipeline installation because the pipeline would be buried, and wetlands would be restored after the completion of construction. The buried pipeline would not interfere with wetland hydrology.

For impacts to wetlands or waters, the City shall be required to apply for a Section 401 Water Quality Certification from the Regional Water Quality Control Board, and a Section 404 permit from the United States Army Corps of Engineers. For impacts to riparian habitat under CDFW jurisdiction, the City would be required to apply for a 1602 permit (Lake or Streambed Alteration Agreement), and comply with all permit conditions, as stated in **Mitigation Measure 3b**. With implementation of **Mitigation Measures BIO-2**, **3a**, and **3b** and with adherence to all required permit conditions, impacts on wetlands and waters would be reduced to a less-than-significant level.

Multi-Use Pathway

The multi-use pathway is estimated to cross approximately 68 square feet of saline emergent wetland, which would constitute a permanent impact. Construction may also temporarily impact a small amount of additional wetland during installation of the path. The remainder of the multi-use pathway would cross non-native annual grassland, which is not a sensitive community.

As above, for impacts to wetlands or waters, the City shall be required to apply for federal and state permits for impacts to wetlands, and comply with all permit conditions, as stated in Mitigation Measure 3b. With implementation of **Mitigation Measures BIO-2**, **3a**, and **3b**, and with adherence to all required permit conditions, impacts on wetlands and waters would be reduced to a less-than-significant level.

Mitigation Measures

See **Mitigation Measures BIO-2 Minimize Impacts on Wetlands and Riparian Woodlands**, **BIO-3a Habitat Restoration and Monitoring**, and **BIO-3b Permanent Impacts**, as described above.

Significance Determination

Less than significant with mitigation incorporated.

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

The proposed parallel force main and multi-use path would cross developed areas, including parking lots and existing paths, and would be adjacent to residential and commercial buildings. These developed areas do not constitute a migratory wildlife corridor. While small terrestrial wildlife may use open grassland areas, riparian corridors or ephemeral channels for movement, no area of the alignment is considered an Essential Connectivity Area by the California Essential Habitat Connectivity database, nor shown to contain a corridor or linkage (CDFW 2023c). Aquatic species, including steelhead, may use Adobe Creek as a corridor and nursery site during the rainy season; however, the project would avoid direct or permanent impacts to this waterway, because the pipeline would be constructed in the dry season (from June through October) using microtunneling. Mitigation Measures BIO-1a, BIO-1b, BIO-1d, BIO-1e, BIO-2, BIO-3a and BIO-3b would be implemented to protect and restore riparian habitat. With implementation of mitigation, the project would not interfere substantially with a wildlife corridor or nursery site and impacts would be less than significant.

Mitigation Measures

See **Mitigation Measures BIO-1a Steelhead, BIO-1b Terrestrial Species, BIO-1d Nesting Birds, BIO-1e Bats BIO-2 Minimize Impacts on Wetlands and Riparian Woodlands**, **BIO-3a Habitat Restoration and Monitoring**, and **BIO-3b Permanent Impacts**, as described above.

Significance Determination

Less than significant with mitigation incorporated.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The City of Petaluma Tree Preservation Ordinance (Municipal Code Ch. 17) protects mature trees, groves and stands, including all riparian trees, and native trees over a specified size (e.g., coast live oaks over 4 inches diameter at breast height) to avoid loss of tree canopy and perpetuate the urban forest. Tree removal requires an arborist report and permit from the City's Community Development Department, which mandates replacement at a 1:1 or 2:1 basis depending on the health of the removed tree, or payment of an in-lieu fee if replacement is not feasible.

Preliminary estimates of trees to be removed show that removal of up to about 35 trees is expected to be necessary. If any trees to be removed fall under the tree ordinance as described above, removal would require a tree removal permit and complying with terms of the permit, including re-planting. Mitigation Measures BIO-4 would be implemented, and the project would comply with permit conditions, which would reduce the impact of tree removal to a less-than-significant level.

Mitigation Measures

Mitigation Measure BIO-4. Tree Preservation Before the start of construction the City shall retain an arborist to complete an arborist report and prepare a tree preservation plan. Trees shall be protected by implementing the following measures:

- Locations of trees to be removed and protected shall be shown in the construction drawings. Pruning and trimming shall be completed by the Contractor and approved by the City. Pruning shall adhere to the Tree Pruning Guidelines of the International Society of Arboriculture.
- Erect exclusion fencing five feet outside of the drip lines of trees to be protected. Erect and maintain a temporary minimum 3-foot-high orange plastic mesh exclusion fence at the locations as shown in the drawings. The fence posts shall be six-foot minimum length steel shapes, installed at 10-feet minimum on center, and be driven into the ground. The Contractor shall be prohibited from entering or disturbing the protected area within the fence except as directed by the City. Exclusion fencing shall remain in place until construction is completed and the City approves its removal.
- No grading, construction, demolition, trenching for irrigation, planting or other work, except as specified herein, shall occur within the tree protection zone determined by arborist and established by exclusion fencing installed shown in the drawings. In addition, no excess soil, chemicals, debris, equipment or other materials shall be dumped or stored within the tree protection zone.
- In areas that are within the tree drip line and outside the tree protection zone that are to be traveled over by vehicles and equipment, the areas shall be covered with a protective mat composed of a 12-inch thickness of wood chips or gravel and covered by a minimum ¾-inch-thick steel traffic plate. The protective mat shall remain in place until construction is completed and the City approves its removal.
- Tree roots exposed during trench excavation shall be pruned cleanly at the edge of the excavation and treated to the satisfaction of a certified arborist provided by the City.
- Any tree injured during construction shall be evaluated as soon as possible by a certified arborist provided by the City and replaced as deemed necessary by the certified arborist.
- Any trees that must be removed shall be replaced in kind.

Significance Determination

Less than significant with mitigation.

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

No Habitat Conservation Plans or Natural Community Conservation Plans cover the area of the project. Thus, the proposed project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan, and there would be no impact on habitat conservation plans from the project.

Mitigation Measures

None required.

Significance Determination

No impact.

3.5 Cultural Resources

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	[ ]	[ ]	[ ]	[X]
b) Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5?	[ ]	[X]	[ ]	[ ]
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	[ ]	[X]	[ ]	[ ]

Discussion

A cultural resources investigation was completed by archaeologists with Environmental Science Associates (ESA). ESA received the results of a records search from the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) on September 5, 2023 (File No. 23-0308). The review included the proposed project site and a 0.5-mile radius. Previous surveys, studies, and site records were accessed. Records were also reviewed in the Built Environment Resources Directory for Sonoma County, which contains information on places of recognized historical significance, including those evaluated for listing in the National Register of Historic Places, the California Register of Historical Resources, the California Inventory of Historical Resources, California Historical Landmarks, and California Points of Historical Interest. The purpose of the records search was to (1) determine whether known cultural resources have been recorded within the proposed project vicinity; (2) assess the likelihood for unrecorded cultural resources to be present based on historical references and the distribution of nearby sites; and (3) develop a context for the identification and preliminary evaluation of cultural resources.

The NWIC records search indicated that one cultural resource, Masciorini Ranch, has been recorded as intersecting the project site. Eight cultural resources have been previously recorded within 0.5 mile of the project site; these eight resources would not be impacted by the proposed project.

ESA completed a pedestrian survey of the project site on December 22, 2023. The entire alignment, where soil was visible, was surveyed using a maximum of 15-meter transects. The majority of the project site is paved and located adjacent to parking lots serving industrial and office buildings. The pedestrian survey was completed in the undeveloped areas between the western endpoint and the SMART alignment, between Baywood Drive and Casa Grande Road behind the parking lots, around the crossing at the channelized alignment of Adobe Creek, and the portion of the alignment from the Cader Lane entrance to Shollenberger Park to the eastern end of the alignment. All paved portions of the proposed alignment were driven to confirm that there were no areas with visible soil that could be inspected.

During the pedestrian survey no cultural material was identified. Where pedestrian survey was possible, visibility was moderate (30 to 60 percent). Much of the proposed alignment appears to have been highly disturbed. The alignment generally follows a railroad grade that was parallel to Lakeville Highway and much of the alignment has been paved, built over, or has been graded and landscaped.

a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?

A significant impact would occur if the proposed project would cause a substantial adverse change to a historical resource through physical demolition, destruction, relocation, or alteration of the resource. As used in this analysis, *historical resources* refer to historic-era architectural resources or the built environment, including buildings, structures, and objects.

The Masciorini Ranch is considered eligible for the National Register of Historic Places (National Register) under Criterion A for its association with activities that defined the agricultural identity of the region (Kelley et al. 2005). This resource is mapped as the entire parcel that the Masciorini family owned, however no features or artifacts have been identified in the vicinity of the project alignment. The majority of the Ranch's property boundary is now part of the City of Petaluma's Ellis Creek Water Recycling Facility. The project alignment connects to this facility approximately 0.3-miles southwest of the existing ranch house. No artifacts or features were identified during the pedestrian survey and no artifacts or features associated with this resource have been previously identified within 0.25 mile of the project alignment. Therefore, there is no potential for the proposed project to impact the Masciorini Ranch.

No other historical resources are in the project alignment and there would be no impact to historical resources from implementation of the proposed project.

Mitigation Measures:

None required.

Significance Determination

No impact.

b) Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5?

Archaeological resources can be considered both historical resources, according to State CEQA Guidelines Section 15064.5, and unique archaeological resources, as defined in Public Resources Code (PRC) Section 21083.2(g). A significant impact could occur if the proposed project would cause a substantial adverse change to an archaeological resource through physical demolition, destruction, relocation, or alteration of the resource.

The project alignment has experienced significant development, infill and landscape modification. All of the creeks that the proposed project crosses have been channelized and moved from their original alignments to support development and navigation (Sims 2024). The significant level of previous soil disturbance along the project alignment decreases the potential for intact archaeological resources to be present. Therefore, the project alignment has a low potential for archaeological resources to be present. Despite this low potential, the discovery of archaeological materials during ground-disturbing activities cannot be entirely discounted. Because of the potential for an inadvertent discovery of archaeological resources during project implementation, this impact would be potentially significant. The impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure CUL-1** and **Mitigation Measure CUL-2**, which require all construction personnel involved in ground-disturbance to be trained in archaeological resource identification and specify avoidance measures or appropriate treatment of archaeological resources, if any such resources are discovered during project construction.

<u>*Mitigation Measures*</u>:

The following mitigation measures shall be incorporated into the project to reduce potential impacts to unknown cultural resources that could be uncovered during trenching and excavation. The proposed project's potential cultural resources impacts would be less than significant with mitigation incorporated.

> **Mitigation Measure CUL-1: Cultural Resources Awareness Training.** Before any ground-disturbing and/ or construction activities, the City shall require an archaeologist meeting or under the supervision of an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for Archeology to conduct a training program for all construction and field personnel involved in project-related ground disturbance prior to such personnel conducting any on-site activities. The Federated Indians of Graton Rancheria (FIGR) shall be invited to participate in the training program. The training shall outline the general archaeological sensitivity of the area and the procedures to follow if an archaeological resource and/ or human remains are inadvertently discovered during project-related activities.
>
> **Mitigation Measure CUL-2: Inadvertent Discovery of Archaeological Resources.** If pre-contact or historic-era archaeological resources are encountered during project implementation, all construction activities within 100 feet shall halt, and a qualified archaeologist, defined as an archaeologist meeting Secretary of the Interior's Professional Qualifications Standards for Archeology, shall inspect the find within 24 hours of discovery and notify the City of their initial assessment. Work shall be conducted in coordination with a Tribal monitor from the Federated Indians of Graton Rancheria. Pre-contact archaeological materials might include: obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (midden) containing heat-affected rocks,

artifacts, or shellfish remains; stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools (e.g., hammerstones, pitted stones). Historic-era materials might include building or structure footings and walls, and deposits of metal, glass, and/or ceramic refuse.

If the City determines, based on recommendations from the archaeologist that the resource may qualify as a historical resource or unique archaeological resource (as defined in CEQA Guidelines Section 15064.5) and/or a tribal cultural resource (as defined in PRC Section 21080.3), the resource shall be avoided, if feasible. If the resource is indigenous, the recommendations of the FIGR tribe shall also be considered. Consistent with Section 15126.4(b)(3), this may be accomplished through planning construction to avoid the resource; incorporating the resource within open space; capping and covering the resource; or deeding the site into a permanent conservation easement.

If avoidance is not feasible, the City shall consult with FIGR (if the resource is pre-contact), and other appropriate interested parties to determine treatment measures to avoid, minimize, or mitigate any potential impacts to the resource pursuant to PRC Section 21083.2, and CEQA Guidelines Section 15126.4. This shall include documentation of the resource and may include data recovery (according to PRC Section 21083.2), if deemed appropriate, or other actions such as treating the resource with culturally appropriate dignity and protecting the cultural character and integrity of the resource (according to PRC Section 21084.3).

Significance Determination

Less than significant with mitigation incorporated.

c) Disturb any human remains, including those interred outside of dedicated cemeteries?

There is no indication from archival research that any part of the project site has been used for human burial purposes in the recent or distant past. Therefore, it is unlikely that human remains would be encountered during construction of the proposed project. Despite this low potential, the possibility of inadvertent discovery cannot be entirely discounted. Therefore, this impact would be potentially significant. The impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure CUL-3** which specifies the protocol to follow in the event of an inadvertent discovery of human remains, including contacting the County coroner and, if determined to be Native American, working with the designated Most Likely Descendant to appropriate treat the remains.

Mitigation Measure

The following mitigation measure shall be incorporated into the project to reduce potential impacts to unknown human remains that could be uncovered during trenching and excavation. The proposed project's potential cultural resources impacts would be less than significant with mitigation incorporated.

Mitigation Measure CUL-3: Inadvertent Discovery of Human Remains. In the event of discovery or recognition of any human remains during construction activities, all such activities within 100 feet of the find shall cease until the Sonoma County Coroner has been contacted to determine that no investigation of the cause of death is required. The Native American Heritage Commission (NAHC) shall be contacted within 24 hours if the Coroner determines that the remains are Native American. The NAHC shall then identify the person or persons it believes to be the most likely descendant from the deceased Native American, who in turn would make recommendations to the City for the appropriate means of treating the human remains and any grave goods.

Significance Determination

Less than significant with mitigation incorporated.

3.6 Energy

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	[ ]	[ ]	[X]	[ ]
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	[ ]	[ ]	[X]	[ ]

Discussion

Energy resources include diesel fuel, gasoline, natural gas, electricity, and other fuels. Electricity production requires the consumption or conversion of resources, including water, wind, oil, gas, coal, solar, geothermal, or nuclear resources, into energy. Energy production and energy use both result in the depletion of nonrenewable resources (e.g., oil, natural gas, coal) and emission of pollutants. Energy consumption is typically measured using the British Thermal Unit (Btu), which is the amount of energy required to raise the temperature of one pound of water by one-degree Fahrenheit. Electrical power is measured in watts; one kilowatt hour (kWh) is a measure of electricity equivalent to 3,412 Btu.

According to the California Energy Commission (CEC 2023), California's total system energy use in 2022 was 287,219 gigawatt-hours (GWh). Total renewable energy (i.e., solar, wind, nuclear, hydroelectric, geothermal, and biomass) made up 54.23 percent, whereas non-renewables (i.e., natural gas, coal, and other) comprised 45.77 percent. In 2022, Sonoma County consumed a total of 2,880 GWh of electricity (CEC 2022).

According to CEC surveys on retail sales of gasoline, diesel, and other transportation fuels (CEC 2023b), gasoline is the most used fuel in California's transportation sector. Statewide in 2022, there were 13,640 million gallons of gasoline sold, 3,067 million gallons of diesel sold, and 91.45 million gallons of E85 sold as transportation fuel.

SCP is the local energy generation provider for Sonoma and Mendocino counties, with the exception of the incorporated cities of Healdsburg and Ukiah, which have their own city-operated public power utilities. SCP manages the purchasing, rate setting, and sourcing of electricity, while transmission is handled by Pacific

Gas and Electric (PG&E). According to SCP's 2022 power content label (SCP 2023), 50.3 percent of the electricity in its CleanStart plan comes from renewables, 40.0 percent from large hydroelectric, 0.9 percent from nuclear, and 8.8 percent from other/ unspecified sources. The City of Petaluma municipal operations sources its electricity from SCP's EverGreen Program (City of Petaluma 2021), which, in 2022, obtained 100 percent of its electricity comes from renewables (86.5 percent from geothermal, 13.5 percent from solar). Customers within the SCP service area have the option of opting out of Sonoma Clean Power and into service provided by PG&E. According to PG&E's power content label for its base plan in 2022, its electricity comes from approximately 38.3 percent renewables, 7.6 percent large hydroelectric, 4.8 percent natural gas, and 49.3 percent nuclear. PG&E offers "solar choice" plans that have a higher percentage of electricity from solar and lower percent from hydroelectric, natural gas, and nuclear (PG&E 2023).

In 2019, the City of Petaluma consumed energy across the following sectors: buildings and facilities; streetlights and traffic signals; airport facilities; employee travel; fleet vehicles; transit vehicles; wastewater and water (City of Petaluma 2021). Wastewater and water-related energy use included the City's operation of the ECWRF, and its sewer, water, and wastewater pumps. In 2019, the City's sewer, water, and wastewater sector consumed 1,411,894 kWh of electricity. The ECWRF consumed 8,853,620 kWh and a sewer pump station at 950 Hopper Street consumed 787,237 kWh of electricity. The ECWRF consumed 19,567 kWh of natural gas, making it the second-largest natural gas consuming facility within the City's municipal operations, after the City's Swim Center. The City of Petaluma owns a variety of vehicle types used for street maintenance, fire protection, and other functions. Fleet vehicles accounted for approximately 125,000 gallons of fuel consumed in 2019: 28,545 gallons of diesel fuel and 96,418 gallons of gasoline. The fleet contains four electric passenger vehicles.

The City of Petaluma General Plan 2025 contains goals, policies, and programs to reduce energy consumption and increase renewable energy. Chapter 4: The Natural Environment contains policies and programs to reduce reliance on non-renewable energy sources in existing and new development. Policies supporting alternative transportation systems that, in turn, reduce demand for vehicle fuel, are identified in Chapter 5: Mobility. Policies and Programs of the General Plan 2025 relevant to the proposed project include:

- Policy/ Program 4-P-18 Develop and adopt local energy standards that would result in less energy consumption than standards set by the California Energy Commission's (CEC) Title 24 or updates thereto.
- Policy/ Program 4-P-19 Encourage use and development of renewable or nontraditional sources of energy.
- Policy/ Program 5-P-15 Implement the bikeway system as outlined in the Bicycle and Pedestrian Plan, and expand and improve the bikeway system wherever the opportunity arises.
- Policy/ Plan 5-P-25 Establish a network of multi-use trails to facilitate safe and direct off-street bicycle and pedestrian travel. At the minimum, Class I standards shall be applied unless otherwise specified.
- Policy/ Plan 5-P-34 Utilize a creative variety of measures to fully implement all projects and programs of the Petaluma Bicycle and Pedestrian Plan.

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Construction of the proposed project would involve construction-related fossil fuel consumption from operation of diesel-powered construction equipment, and fossil fuel consumption from material hauling, delivery, and worker vehicle trips. The anticipated construction equipment fleet for the proposed project includes typical construction equipment such as a backhoe/loader, excavator, crane, utility truck, water truck, dump trucks, concrete saw, sweeper, paver, and generator. The microtunneling phase would involve specialized equipment, such as the microtunneling boring machine and crushing/processing equipment. The construction equipment fleet assumed for the proposed project is summarized in **Table 2-1.** The proposed project would implement typical construction practices such as trenching and repaving. The project would not require unusual or excessive construction equipment or practices that would result in wasteful, inefficient, or unnecessary consumption of energy compared to projects of similar type and size. In addition, the construction fleet contracted for the proposed project would be required to comply with the CARB In-Use Off-Road Diesel-Fueled Fleets Regulations, which would limit vehicle idling time to five minutes, restrict adding vehicles to construction fleets with older-tier engines, and establish a schedule for retiring older, less fuel-efficient engines from the construction fleet (CARB 2019).

Once construction is complete, the proposed project would involve minimal operational energy consumption. Routine inspection of the pipeline and maintenance holes would be incorporated into the City's existing operation and maintenance activities and would not cause a net change in vehicle trips or associated fossil fuel consumption. The multi-use pathway would add lights, which would slightly increase the demand for electricity from SCP's EverGreen Program. The multi-use pathway lighting would be necessary for safety and the City would use energy in a non-wasteful, efficient manner to keep utility costs as low as possible. Therefore, construction and operation of the proposed project would not result in wasteful, inefficient, or unnecessary consumption of energy and impacts would be less than significant.

Mitigation Measures

None required.

Significance Determination

Less than significant.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The City of Petaluma General Plan 2025 focuses on reducing energy consumption, increasing renewable energy, and supporting alternative transportation systems. As explained under "a" above, the project would not involve wasteful or inefficient energy consumption during construction or operation. The proposed project would result in a minimal increase in energy use from the multi-use pathway lighting. The City of Petaluma municipal operations sources its electricity from SCP's EverGreen Program which sources its electricity from renewables. Thus, the project would support the City's renewable energy goals. Operation of the project would support the General Plan 2025 goals related to a network of multi-use trails and, therefore, would not interfere with local plans related to renewable energy or efficiency. Because the project would not result in a net increase in operational vehicle trips and would not change land use patterns, it would not conflict with statewide plans related to energy use. The proposed project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Impacts would be less than significant, and no mitigation would be required.

Mitigation Measures

None required.

Significance Determination

Less than significant.

3.7 Geology and Soils

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	[ ]	[ ]	[X]	[ ]
ii) Strong seismic ground shaking?	[ ]	[X]	[ ]	[ ]
iii) Seismic-related ground failure, including liquefaction?	[ ]	[X]	[ ]	[ ]
iv) Landslides?	[ ]	[X]	[ ]	[ ]
b) Result in substantial soil erosion or the loss of top soil?	[ ]	[X]	[ ]	[ ]
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or	[ ]	[ ]	[X]	[ ]

	off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?				
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	[ ]	[X]	[ ]	[ ]
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	[ ]	[ ]	[ ]	[X]
f)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	[ ]	[ ]	[X]	[ ]

Discussion

The City of Petaluma lies within a seismically active region classified by the California Building Code (CBC) as Seismic Zone 4 where the most stringent CBC standards apply. Geologic hazards within the City of Petaluma are largely related to seismic ground shaking and associated effects such as liquefaction, ground failure, and seismically induced landslides. Faults in the vicinity of Petaluma are capable of generating large earthquakes that could produce strong to violent shaking. The Rodgers Creek Fault is located less than 5 miles to the northeast of the City. Although branches of the Rodgers Creek Fault closest to the City are not historically active (within the last 200 years), they do show evidence of activity during the past 11,000 years, which is a relatively short time in terms of geologic activity.

There are several areas of liquefication susceptibility in the City of Petaluma (USGS nda; City of Petaluma 2020). Most of the City is in a moderate liquefication susceptibility zone, while areas in the center of the City and close to Highway 101 near Washington Street and Western Avenue are within more severe liquefaction susceptibility zones (USGS nda). Approximately 1,851 acres fall in high liquefaction susceptibility areas within Petaluma and 559 acres in very high liquefaction susceptibility areas (City of Petaluma 2020). The majority of the highly susceptible categories follow the Northwestern Pacific railroad, which is similar to the Petaluma River's general location as it flows (City of Petaluma 2020).

The project site is underlain by Quaternary alluvium and marine deposits (Pleistocene to Holocene), which include alluvium, lake, playa, and terrace deposits (USGS ndb). According to the National Resources Conservation Service's Web Soil Survey, soils underlying the project area consist predominantly of Clear Lake Clay and Reyes Clay (NRCS n.d.). The Clear Lake series consists of very deep, poorly drained soils that formed in fine textured alluvium derived from mixed rock sources (National Cooperative Soil Survey [NCSS] 2018), while the Reyes series consist of very deep, poorly drained soils that formed in alluvium along the margin of bays (NCSS 2020).

a.i) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 41.

The potential for ground rupture is most likely to occur along the traces of active faults. According to the California Department of Conservation's California Earthquake Hazards Zone Application, the proposed project site is not located within an Alquist-Priolo Earthquake Fault Zone and no known active faults traverse the site (California Department of Conservation [CDOC] 2022). The nearest potentially active fault mapped in accordance with the Alquist-Priolo Earthquake Fault Zoning Act is the Rodgers Creek Fault Zone, which is approximately 3 to 5 miles from the project site. Due to the distance of the Rodgers Creek Fault Zone, there is no potential for surface fault rupture in the project area and the project would have no impact.

a.ii) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Strong seismic ground shaking?

The project site is located within a seismically active region of northern California near faults capable of generating earthquakes with strong ground shaking. The intensity of ground shaking would depend upon the magnitude of the earthquake, distance to the epicenter, and the geology of the area between the epicenter and the project site.

The closest active fault zone to the project site is the Rodgers Creek Fault Zone. The Rodgers Creek Fault Zone is the main strand of the North American-Pacific Plate boundary north of San Francisco Bay that accommodates 6 to 10 millimeters per year of plate-boundary motion (Hecker and Loar 2018). The USGS estimates that there is a 33 percent chance of a magnitude (M)>= 6.7 earthquake on the combined Rodgers Creek – Hayward fault system, which is the highest probability of occurrence among faults in the region (Hecker and Loar 2018).

Seismic activity is common in California, and the project would be designed and constructed per the City of Petaluma's Sewer System Design and Construction Guidelines, which would ensure structural resiliency (City of Petaluma 2021). The project would also be designed and constructed pursuant to applicable American Water Works Association standards and would incorporate measures to accommodate seismic loading pursuant to guidelines such as the "Greenbook" Standard Specifications for Public Works Construction (Greenbook Committee of Public Works Standards, Inc. 2018) and the International Building Code (IBC; International Code Council 2018). These guidelines are produced through joint efforts by industry groups to provide standard specifications for engineering and construction activities, including measures to accommodate seismic loading parameters. These standards and guidelines are widely accepted by regulatory authorities and are regularly included in related standards such as municipal building and grading codes. In addition, the project design would follow guidelines within the California Building Code (CBC; California Code of Regulations, Title 24, Part 2), which is based on the IBC with amendments to reflect conditions specific to California.

A geotechnical report shall be prepared to provide final geotechnical findings, geologic and seismic settings, logs of borings, a boring location map, boring log legend, laboratory test results, engineering properties of ground sampled in borings, geologic hazards, design groundwater elevation, current IBC/CBC seismic Soil Class, and recommendations regarding open cut and trenchless installation of the force main and associated structures based on existing geotechnical conditions. The project would be constructed in accordance with the recommendations of the geotechnical report, as required by **Mitigation Measure GEO-1**.

By adhering to seismic building and construction regulations, and the recommendations in the Geotechnical Investigation Report, the risk of structural damage or loss resulting from seismic ground shaking would be minimized. Even if structural damage does occur during a seismic event, it would be isolated to specific project elements; the project would not exacerbate a risk of seismic-related damage to other existing resources and land uses in the vicinity. Impacts would be less than significant with implementation of **Mitigation Measure GEO-1**.

a.iii) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Seismic-related ground failure, including liquefaction?

Liquefaction is the rapid transformation of saturated, loosely packed, fine-grained sediment to a fluid like state as a result of ground shaking. The potential for liquefaction is most pronounced when the groundwater table is shallow (typically less than 50 feet below the surface) and liquefaction potential becomes increasingly heightened as the water table becomes shallower. A draft Geotechnical Data Memo for the PIPS parallel force main was prepared in 2021 and found that the project site is in a very high liquefication susceptibility zone (McMillen Jacobs Associates 2021). To ensure that the project can adequately withstand liquefication and settlement, the City shall implement **Mitigation Measure GEO-1**, which requires preparation of a design level geotechnical analysis specifying earthwork and foundation design recommendations. With implementation of **Mitigation Measure GEO-1** potential impacts relating to seismic-related ground failure would be reduced to less than significant levels.

a.iv) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Landslides?

Seismically induced landslides and slope failures are common occurrences during or soon after large earthquakes. Landslides can occur when strong ground movement such as an earthquake shakes loose soil and causes land and debris to lose stability and slide. Landslides have been known to occur in Sonoma County but are typically limited to slopes steeper than 15 percent and confined to areas underlain by geologic units that have demonstrated stability problems in the past. According to the City of Petaluma Local Hazard Mitigation Plan, the proposed project site is not in a landslide susceptibility zone (City of Petaluma 2020). Additionally, the project would be designed and constructed in accordance with standards and guidelines described under "a.ii" above and in accordance with **Mitigation Measure GEO-1,** which would limit the potential for the project to directly or indirectly cause substantial adverse effects, including risk of loss, injury, or death resulting from a project failure during a seismically induced landslide or slope failure. Therefore, the project would have a less than significant impact.

<u>Mitigation Measures</u>

The following mitigation measure is required to reduce potential impacts associated with directly or indirectly causing potential substantial adverse effects involving seismic ground shaking, ground failure, and landslides. The proposed project's impacts would be less than significant with mitigation incorporated.

> **Mitigation Measure GEO-1: Geotechnical Report** The City shall prepare a preconstruction design-level geotechnical report which includes geotechnical-related recommendations for design of the

project and all applicable geologic report standards, reconnaissance and subsurface exploration data, laboratory test results, and conclusions and recommendations, including but not limited to:

- Site preparation, excavation, fill placement and compaction, temporary and permanent cut and fill slope inclinations (including whether slopes steeper than 3:1 can be used at the site), slope stability, slope erosion mitigation, and landslide movement mitigation
- Surface and subsurface drainage systems, including drainage associated with grading for landslide movement mitigation and new cut and fill slopes
- Pavement design for pathways where applicable
- Utility trench backfill, including check dams and trench drainage, if appropriate
- Geologic/geotechnical construction monitoring, testing, and certification requirements
- Trail construction and long-term maintenance requirements, including criteria for inspecting and maintaining culverts and pathway surfaces, as appropriate

The geotechnical report shall include measures, as necessary, to reduce the potential for static and earthquake-induced slope movements that may adversely impact the project. Engineering analyses shall estimate the factors of safety against slope movements in the development area.

All recommendations outlined in the preconstruction design-level geotechnical report are herein incorporated by reference and shall be adhered to in order to ensure that appropriate measures are incorporated into the design and construction of the project. Nothing in this mitigation measure shall preclude the City from requiring additional information to be provided to determine compliance with applicable standards. The project plans and specifications shall be prepared in accordance with the geotechnical recommendations for the project. The project geotechnical engineer or personnel under their direct supervision shall inspect the construction of geotechnical and/or geologic aspects of the project to ensure the geotechnical and geologic aspects of the project plans and specifications have been appropriately constructed at the site and are acceptable to the project.

Significance Determination

Less than significant with mitigation incorporated.

b) Result in substantial soil erosion or the loss of top soil?

Construction of the project components would require soil-disturbing activities such as excavation, which would expose soil and could potentially result in soil erosion or the loss of top soil if not properly controlled. Water and wind serve as the primary catalyst of soil erosion, with steeper slopes intensifying the effects. All earthwork, grading, trenching, backfilling, and compaction activities associated with the project are subject to the City of Petaluma's Grading and Erosion Control Ordinance. Similarly, these activities are also covered by the mandatory requirements of the National Pollution Discharge Elimination System (NPDES) Construction General Permit, which is implemented through a Storm Water Pollution Prevention Plan (SWPPP). A SWPPP would be required, prepared and implemented in compliance with the Construction General Permit. BMPs would be identified in the SWPPP to control and reduce pollutant discharges associated with construction and erosion. Once construction is complete, all pipeline disturbance areas would be returned to pre-project conditions and, therefore, would not result in further soil erosion. Additionally, **Mitigation Measure GEO-2** shall be implemented to further ensure that potential impacts related to soil erosion are reduced to levels below significant. **Mitigation Measure GEO-2** requires the City to approve an erosion control plan that identifies measures to be implemented during all construction activities including remediation and establishes provisions for grading activity during the rainy season. With implementation of the SWPPP, restoration of areas to pre-project conditions, and implementation of **Mitigation Measure GEO-2**, impacts associated with soil erosion during construction and operation would be less significant.

Mitigation Measures

The following mitigation measure shall be implemented for construction of the PIPS parallel force main and multi-use pathway to reduce potential impacts associated with soil erosion or the loss of topsoil. The proposed project's impacts to soil erosion or loss of topsoil would be less than significant with mitigation incorporated.

> **Mitigation Measure GEO-2: Erosion Control Plan** An erosion control plan shall be submitted to the City Engineer for review. All earthwork, grading, trenching, backfilling, and compaction operations shall be conducted in accordance with the City of Petaluma's Grading and Erosion Control Ordinance #1567, Title 17, Chapter 17.31 of the Petaluma Municipal Code. Plans shall detail erosion control measures such as site watering, sediment capture, equipment staging and laydown pad, and other erosion control measures to be implemented during all construction activity.

Significance Determination

Less than significant with mitigation incorporated.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

The majority of the project is underlain by Holocene alluvial fan deposits of clay, silt, sand, gravel and rare cobble, while other areas of the project is underlain by Holocene bay mud of peat, soft, compressible and organic-rich clay, silt, and sand (McMillen Jacobs Associates 2021). Similar to the seismically induced landslide impacts addressed in response *a.iv* above and the liquefication impacts addressed in response *a.iii* above, the project's potential to result in unstable soils that could result in landslides, liquefaction (or lateral spreading which is induced by liquefaction) was determined to be less than significant with mitigation incorporated, due to the relatively flat nature of the project site and the project's location within an existing right-of-way. Additionally, adherence to standards and regulations as described in response *a.ii* above would ensure structural resiliency to earthquake events and any other causes of lateral spreading or liquefaction. Therefore, implementation of the project is not expected to result in significant risk of landslide.

Subsidence is the sudden sinking of an area with little or no horizontal motion. In northern California, subsidence is caused primarily by excessive groundwater or natural gas extraction (City of Petaluma 2006). Groundwater and natural gas extraction activities are not permitted within the City of Petaluma's Urban Growth Boundary, so it is not a major concern in the City. Additionally, the proposed project would be constructed to the standards described in response *a.ii* and fill materials used to backfill would be stable with little risk of subsidence or collapse. The project would be constructed in accordance with **Mitigation Measure GEO-1,** which would limit the potential for the project to be susceptible to risks associated with land subsidence or collapse. Therefore, the project would have a less than significant impact with mitigation.

Mitigation Measures

See **Mitigation Measure GEO-1 Geotechnical Report**, as described above.

Significance Determination

Less than significant with mitigation.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Expansive soils have the ability to significantly change their volume, shrink and swell, due to their soil moisture content. Expansive soils can crack rigid structures and potentially create pipeline rupture. Typically, expansive soils are very fine grained with a high to very high percentage (60 percent or more) of clay. Based on the discussion above, the project site is underlain by Quaternary alluvium and marine deposits (Pleistocene to Holocene), which include alluvium, lake, playa, and terrace deposits (USGS ndb). Alluvium, playa, and terrace deposits generally contain sand, silt, and clay, which are included in Table 1806.2 of the California Building Code and may exhibit expansive potential. To reduce potential impacts due to the presence of expansive soils, **Mitigation Measure GEO-1**, shall be implemented, which requires a preconstruction design level geotechnical report be prepared to mitigate the effect of expansive clay in the project site. Adherence to **Mitigation Measure GEO-**1, including any other recommendations derived through mandatory conformance with Title 24 (California Building Code Standards), would ensure the project results in a less than significant impact from expansive soils.

Mitigation Measures

See **Mitigation Measure GEO-1: Geotechnical Report**, as described above

Significance Determination

Less than significant with mitigation.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

The project does not propose the construction or use of septic tanks or alternative wastewater disposal systems. Therefore, there would be no impact.

Mitigation Measures

None required.

Significance Determination

No impact.

f) Directly or indirectly destroy a unique paleontological resource of site or unique geologic feature?

The California Public Resources Code (Section 5097.5) prevents an individual from removing, destroying, or altering any paleontological resources found on public lands without the permission of the public agency that has jurisdiction over the lands. The depth of excavation for trenching of the PIPS parallel force main would range from 4 to 20 feet. The depth of excavation for the access pits for microtunneling of the PIPS parallel force main could be down to 20 feet. The PIPS parallel force main pipeline alignment and multi-use pathway run along areas described as soft Bay Mud (Miller Pacific 2019). This alignment was largely within the marshlands. The soft shallow Bay Mud geologic deposits through this area are less than 5,000 years old. The Society of Vertebrate Paleontologists (SVP) has concluded that geologic deposits that are less than 5,000 years old do not contain significant paleontological resources (SVP 2010). In addition, soft Bay Mud deposits are common throughout the San Francisco Bay area and are not considered unique geologic formations (USGS 1978). Given the relative recency of geologic deposits, the area would have a low potential to encounter paleontological resources, but **Mitigation Measure PALEO-1** is included in the event of an unexpected discovery. The impact would be less than significant with mitigation.

Mitigation Measures

The following measure would be implemented in the unlikely event that a paleontological resource is discovered:

> **Mitigation Measure PALEO-1: Paleontological Resource Protection** Prior to the start of ground-disturbing activities, a paleontological resource awareness training overseen by a Paleontological Resource Specialist who meets the minimum or equivalent qualifications for a qualified professional paleontologist, shall be required for all construction personnel participating in ground-disturbing construction to alert them to the paleontological sensitivity of the area and provide protocols to follow in the event of a discovery of paleontological materials. If paleontological resources are encountered during project-related excavations, construction shall be halted or diverted to allow a qualified paleontological resources specialist (PRS) an opportunity to assess the resource and determine measures needed to preserve or record any site determined to be potentially significant. The PRS will meet the minimum or equivalent qualifications for a qualified professional paleontologist, as described in the SVP guidelines (2010). The assessment of the resource and measures shall be developed in accordance with professional guidelines, consistent with those issued by SVP (2010), and designed to avoid impacts on paleontological resources through salvage and curation. The PRS will also prepare a Paleontological Resources Report describing the treatment of any paleontological resources unearthed during construction.

Significance Determination

Less than significant with mitigation.

3.8 Greenhouse Gas Emissions

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

Discussion

GHGs are pollutants that are known to increase the greenhouse effect in the earth's atmosphere thereby adding to global climate change impacts. Several pollutants have been identified as GHGs, and the California definition of a GHG in the Health and Safety Code, Section 38505(g) includes carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Water vapor is also a GHG; however, it is short lived, and concentrations are largely determined by natural processes such as evaporation. Other GHGs such as fluorinated gases are created and emitted through anthropogenic sources. The most common anthropogenic GHGs are CO_2, CH_4, and N_2O.

A measurement called Global Warming Potential (GWP) is used to measure how much energy the emissions of one ton of a gas will absorb over a given period of time, relative to the emissions of one ton of CO_2. CO_2e is the amount of GHG emitted multiplied by its GWP. CO_2 has a 100-year GWP of one; CH_4 has a GWP of 25; and N_2O has a GWP of 298.

SB 32, passed in 2016, required that in the next update to the Assembly Bill (AB) 32 Scoping Plan, CARB should "ensure that statewide GHG emissions are reduced to at least 40 percent below the statewide GHG emissions limit no later than December 31, 2030." AB 1279 directs that statewide GHG emissions be reduced by 85 percent below 1990 levels by 2045 and that the State achieve net zero carbon emissions no later than 2045.

CARB adopted the AB 32 Scoping Plan in December 2008, a Scoping Plan Update in December 2017, and another Scoping Plan Update in December 2022. The Scoping Plan contains the strategies California will implement to achieve net zero GHG emissions by 2045. In the Scoping Plan, CARB focuses on, "outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the State's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities."

The BAAQMD has jurisdiction over the City of Petaluma and project area. Under CEQA, BAAQMD is a commenting responsible agency on projects that affect air quality within its jurisdiction. In addition, BAAQMD publishes non-binding guidelines to assist lead agencies in evaluating air quality and GHG impacts from CEQA projects. The BAAQMD CEQA Guidelines were published in 2012 and revised in 2017. BAAQMD adopted new Climate Impact Thresholds in 2022 for evaluating typical land use projects, such as residential and commercial developments (BAAQMD 2022).

The City of Petaluma Climate Emergency Framework (the Framework) (City of Petaluma 2021) outlines principles to guide the City's ongoing response to and discussion about the climate crisis and to guide and inform subsequent policies and implementation strategies. The Framework covers measures the City can take to reduce GHG emissions, measures to prepare for the effects of climate change, community engagement, and climate justice. The Framework also recommends that the City of Petaluma achieve carbon neutrality by 2030, to respond to international, State, County and City goals.

The City of Petaluma published a draft climate action plan in October 2023 called the Blueprint for Carbon Neutrality. The Blueprint for Carbon Neutrality serves as a pathway for achieving the City's goal of being carbon neutral by 2030 and builds on previous City initiatives like the fleet electrification program and the 2021 Climate Emergency Framework. It contains suggested City sustainability plans, policies, and programs to address GHG emissions from City municipal operations. The Blueprint has actions across the sectors of buildings, energy, transportation, resource consumption, and ecosystems. The Blueprint has not yet been adopted.

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

The project would create GHG emissions during construction. Project construction is anticipated to last 22 months, from approximately November 2025 to September 2027. Construction impacts would include vehicle and equipment emissions associated with pipeline trenching and installation, microtunneling, connecting the parallel force main at the PIPS and ECWSRF facilities, and resurfacing.

Modeling of GHG from construction was completed in CalEEMod version 2022.1.1.20. Details on construction, including timing and equipment, can be found in *Section 2.4 Proposed Project Description*. GHG emissions would result from vehicle use, including construction equipment, haul trips, and worker trips. Other project details necessary for GHG emissions modeling were obtained from CalEEMod and the design engineer estimates (e.g., equipment horsepower, load factors, fleet mix, and vehicle emissions factors).

The results of the inventory for GHG emissions, as shown in the CalEEMod output tables in **Appendix A**, are presented in **Table 3-4**. Note that BAAQMD's CEQA Guidelines do not include significance thresholds for construction related GHG emissions because, according to BAAQMD, emissions from construction represent a very small portion of a project's lifetime GHG emissions. However, BAAQMD recommends that construction related GHG emissions be quantified and disclosed, and that feasible best management practices be adopted to reduce them.

Table 3-4: Proposed Project Construction GHG Emissions per Year ($MTCO_2e$/year)

Construction Year	$MTCO_2e$
2025	1,218
2026	162
Total $MTCO_2e$ (all years)	**1,380**

Based on the results of CalEEMod modeling, construction of the proposed project would emit a total of 1,380 $MTCO_2e$. The project would adhere to existing energy efficiency requirements during construction, including CARB's In-Use Off-Road Diesel-Fueled Fleets Regulations that limit vehicle idling time to five minutes and establish a schedule for retiring older and less fuel-efficient engines (CARB 2019). In addition, as recommended by BAAQMD, the City would ensure the best management practices listed in **Mitigation Measure GHG-1** would be incorporated into the project during construction to minimize GHG emissions. Construction related GHG impacts would be less than significant with mitigation.

After construction is complete, the pipeline would not require additional net energy to operate, and inspection of the pipeline would be incorporated into the City's existing operation and maintenance trips. The multi-use pathway would add lights, which would slightly increase the demand for electricity from SCP's EverGreen Program. SCP's EverGreen Program obtains 100 percent of its electricity from renewables. Thus, operation of the project would not generate a net increase in operational GHG emissions and impacts would be less than significant.

Mitigation Measures

Mitigation Measure GHG-1. Best Management Practices for Construction-Related GHG Emissions. The City shall ensure the construction contractor implements the feasible measures in the list below during construction in order for the proposed project to have a less-than-significant impact related to construction-related GHG emissions.

- Use zero-emission and hybrid-powered equipment to the greatest extent possible, particularly if emissions are occurring near sensitive receptors.
- Require all diesel-fueled off-road construction equipment be equipped with EPA Tier 4 Final compliance engines or better as a condition of contract.
- Require all on-road heavy-duty trucks to be zero emissions or meet the most stringent emissions standard, such as model year (MY) 2024 to 2026, as a condition of contract.
- Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to no more than 2 minutes (A 5-minute limit is required by the state airborne toxics control measure [Title 13, Sections 2449(d)(3) and 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site and develop an enforceable mechanism to monitor idling time to ensure compliance with this measure.
- Prohibit off-road diesel-powered equipment from being in the "on" position for more than 10 hours per day.

- Use California Air Resources Board–approved renewable diesel fuel in off-road construction equipment and on-road trucks.
- Use U.S. Environmental Protection Agency SmartWay certified trucks for deliveries and equipment transport.
- Require all construction equipment is maintained and properly tuned in accordance with manufacturer's specifications. Equipment should be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Where grid power is available, prohibit portable diesel engines and provide electrical hook ups for electric construction tools, such as saws, drills and compressors, and using electric tools whenever feasible.
- Where grid power is not available, use alternative fuels, such as propane or solar electrical power, for generators at construction sites.
- Encourage and provide carpools, shuttle vans, transit passes, and/or secure bicycle parking to construction workers and offer meal options onsite or shuttles to nearby meal destinations for construction employees.
- Reduce electricity use in the construction office by using LED bulbs, powering off computers every day, and replacing heating and cooling units with more efficient ones.
- Minimize energy used during site preparation by deconstructing existing structures to the greatest extent feasible.
- Recycle or salvage nonhazardous construction and demolition debris, with a goal of recycling at least 15% more by weight than the diversion requirement in Title 24.
- Use locally sourced or recycled materials for construction materials (goal of at least 20% based on costs for building materials and based on volume for roadway, parking lot, sidewalk and curb materials). Wood products used should be certified through a sustainable forestry program.
- Use low-carbon concrete, minimize the amount of concrete used and produce concrete on-site if it is more efficient and lower emitting than transporting ready-mix.
- Develop a plan to efficiently use water for adequate dust control because substantial amounts of energy can be consumed during the pumping of water.
- Include all requirements in applicable bid documents, purchase orders, and contracts, with successful contractors demonstrating the ability to supply the compliant on- or off-road construction equipment for use prior to any ground-disturbing and construction activities.

Significance Determination

Less than significant with mitigation incorporated.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The Climate Emergency Framework (City of Petaluma 2021) serves as the City's applicable greenhouse gas reduction plan.

The following goals are included in the Mitigation and Sequestration section of the Framework to support its vision of achieving carbon neutrality by 2030.

- Eliminate transportation emissions by:
    - Reducing Vehicle Miles Traveled (VMT) through active transportation, land use policy, infill development and increased density
    - Increased public transit investment
    - Encouragement of and support for non-combustion vehicles
- Eliminate emissions from the building sector through zero-emission new construction (emissions embedded in materials and those emitted during construction and operation), building retrofits, appliance replacements and use of renewably generated clean electricity.
- Generate zero waste (commonly understood as 90% diversion) by 2030, moving as quickly and closely as possible to 100% diversion.
- Enhance the urban forest and adopt regenerative land-management practices across the Petaluma watershed and regionally in partnership with appropriate parties to maximize exemplary carbon capture and soil restoration.
- Reduce consumption emissions to the level necessary to meet our overall climate goals.

The following goals are included in the Adaptation and Social Resilience section of the Framework to support its vision of preparing for the expected impacts of climate change and strengthening its infrastructure for a quicker and more complete recovery.

- Develop resilient infrastructure and community readiness, including backup sources of water, power, and communications.
- Restore and enhance local ecosystem health and improve their resilience to climate change.
- Facilitate development that minimizes and anticipates impacts from climate change and respects the ecological health of the Petaluma River, wetlands, wet meadow, grasslands, greenbelt, and open space ecosystems.

As explained under "a" above, the project would not result in GHG emissions that conflict with the BAAQMD CEQA Guidelines because under **Mitigation Measure GHG-1** the project is required to use BMPs. By installing a parallel force main, the project would directly support the City's goal of developing resilient and backup infrastructure. Additionally, site visits would be conducted by existing staff using the City's fleet, which contains four electric passenger vehicles. The proposed project would result in a minimal increase in energy use from the multi-use pathway lighting; however, the City of Petaluma municipal operations sources its electricity from SCP's EverGreen Program, which sources its electricity from renewables. Thus, the pipeline and multi-use pathway would not substantially increase GHG emissions.

Operation of the project would support the Climate Emergency Framework goals related to reducing VMT through active transportation, and using renewably generated clean electricity by using energy from SCP's EverGreen Program. As a municipal project, the proposed project would adhere to the City's programs for diversion of construction and demolition debris, use of electric landscaping equipment, and education of maintenance staff. Therefore, the project would not interfere with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. Impacts would be less than significant, and no mitigation would be required.

Mitigation Measures

None required.

Significance Determination

Less than significant.

3.9 Hazards and Hazardous Materials

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	[ ]	[ ]	[X]	[ ]
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	[ ]	[X]	[ ]	[ ]
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	[ ]	[X]	[ ]	[ ]

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	[ ]	[X]	[ ]	[ ]
e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard or excessive noise for people residing or working in the Project area?	[ ]	[ ]	[ ]	[X]
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	[ ]	[X]	[ ]	[ ]
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	[ ]	[ ]	[X]	[ ]

Discussion

Regulations governing the use, management, handling, transportation and disposal of hazardous materials and waste are administered by federal, state, and local governmental agencies. Federal regulations governing hazardous materials and waste include the Resource Conservation and Recovery Act of 1976 (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA); and the Superfund Amendments and Reauthorization Act of 1986 (SARA).

In California, hazardous materials and waste are regulated by the California Department of Toxic Substances Control (DTSC). The DTSC maintains a hazardous waste and substances site list, also known as the “Cortese List,” which provides information about the location of hazardous materials release sites.

In California, the Environmental Protection Agency oversees the Unified Hazardous Materials and Hazardous Waste Management Program, also known as “Unified Program.” The Unified Program is intended to consolidate and ensure consistency in the administration of requirements, permits, and inspections for six programs. The six programs established by the Unified Program are administered and implemented locally through “Certified Unified Program Agencies” (CUPA). The Petaluma CUPA manages the acquisition, maintenance and control of hazardous materials and waste generated by industrial and commercial business under the auspices of the Petaluma Fire Department. Under CUPA, entities that intend to store, transport, or generate a certain quantity of hazardous waste must apply for and obtain a permit and submit a Hazardous Materials Response Plan and Inventory on an annual basis.

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Typical hazardous materials that may be used during construction and routine operation and maintenance activities include gasoline, diesel fuel, oil solvents, and lubricants. To minimize the risks of exposure to hazardous materials from construction and routine operation and maintenance activities, federal, state, and local regulations have been put into place to regulate hazardous material use, storage, transportation, and handling. The City would be required to be in compliance with all applicable federal, state, and local regulations pertaining to hazardous materials (Federal Code Title 40 and 49; Occupational Safety and Health Administration (OSHA) 29 CFR 1910; California code section 5001, 5401, 5701, and 25507; California Health and Safety Code Division 20, Chapter 6.5, Article 6.5, and Article 6.6), which are intended to minimize health risk to the public associated with hazardous materials.

Additionally the City would be required to implement a Stormwater Pollution Prevention Plan (SWPPP) to address the discharge of construction related pollutants in storm water runoff (including construction-related hazardous materials) through implementation of appropriate best management practices (BMPs). Specific BMPs would be determined during preparation of the SWPPP based on site- and project-specific characteristics (equipment types, etc.) and would be in conformance with the National Pollutant Discharge Elimination System (NPDES) Construction General Permit. Conformance with federal hazardous materials transportation law (49 U.S.C. 5101 et seq.) and California Health and Safety Code Division 20, Chapter 6.5, Article 6.5 would require precautionary measures be taken during the routine transport of hazardous materials, such as testing and preparation of a transportation safety plan. According to California Health and Safety Code Division 20, Chapter 6.5, Article 13, used oil that may be produced from construction or operation of the project would be recycled. With compliance with existing regulations, impacts would be less than significant.

Mitigation Measures

None required.

Significance Determination

Less than significant.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Site preparation and construction activities would result in the temporary presence of potentially hazardous materials including, but not limited to, fuels and lubricants, paints, solvents, insulation, electrical wiring, and other construction related materials on site. Although these potentially hazardous materials may be present on site during construction, the City is required to comply with all existing federal, state, and local safety regulations governing the transportation, use, handling, storage, and disposal of potentially hazardous materials as explained under response “a” above. Additionally, **Mitigation Measure HAZ-1** would minimize the risk of hazardous material exposure through material use and accidents by requiring the City and its construction contractor to develop a Hazardous Materials Management and Spill Prevention and Control Plan to ensure project-specific contingencies are in place.

Because the proposed project requires excavation and restoration of road surfaces, any yellow traffic striping present would be tested for lead and chrome content and asphalt would be tested for asbestos prior to excavation or removal activities. **Mitigation Measure HAZ-2** would be implemented to identify and abate yellow traffic striping that may contain lead chromate and asphalt that may contain asbestos.

Once construction is complete, there is very low to no risk of accidental release of hazard materials during operation.

With the implementation of **Mitigation Measures HAZ-1** and **HAZ-2**, the impacts to the public or the environment from potential accidents from hazardous materials used or encountered during construction would be reduced to less than significant.

Mitigation Measures

The following mitigation measures shall be incorporated into the project to reduce impacts associated with potential accidental hazardous materials release during construction. The proposed project's impacts related to the accidental upset or release of hazardous materials would be less than significant with mitigation incorporated.

Mitigation Measure HAZ-1: Hazardous Materials Management Spill Prevention and Control Plan Before construction begins, the City's construction contractor shall prepare a Hazardous Materials Management Spill Prevention and Control Plan that includes a project-specific contingency plan for hazardous materials and water operations. The Plan will be applicable to construction activities and will establish policies and procedures according to applicable codes and regulations, including but not limited to the California Building Fire Codes, and federal and Occupational Safety and Health Administration regulations. As opposed to a single document, all necessary elements of a Hazards Plan may be developed into contract specifications. The Plan will include, but is not limited to the following:

- Hazardous materials that will be used on the project and management of these materials, including delineation of hazardous material storage areas, access and egress routes, waterways, emergency assembly areas, and temporary hazardous waste storage areas.
- Training procedures for identification of contamination.
- Spill prevention, control, and countermeasures that will be implemented to prevent spills or respond to accidental spills.
- An overview of the notification and documentation procedures to be followed in the event of a spill.

Mitigation Measure HAZ-2: Pre-Demolition Hazardous Material Survey and Abatement A survey will be conducted on collection system projects to identify yellow traffic striping that may contain lead chromate and asphalt that may contain asbestos. Following results of the hazardous materials survey, and incorporating information from current lead and asbestos inventories, demolition or renovation plans and contract specifications, including those for road-disturbing activities, shall incorporate abatement procedures for the removal of materials containing asbestos, lead, and universal waste items, as required by law. All abatement work shall be done in accordance with federal, state, and local regulations, including those of the U.S. Environmental Protection Agency, Occupational Safety and Health Administration, California Occupational Safety and Health Administration, and the Bay Area Air Quality Management District.

Significance Determination

Less than significant with mitigation incorporated.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

The closest school, River Montessori Charter School (3880 Cypress Drive), is within one-quarter mile from the project. There is a low risk of accidental release of hazardous materials and toxic air pollutants during project construction. As explained under responses "a" and "b" above, construction of the proposed project would be compliant with regulations and implementation of **Mitigation Measures HAZ-1 and HAZ-2** would reduce the risk of hazardous emissions to the environment associated with construction and demolition and excavation of any unidentified soil contamination. Additionally, the BMPs required by **Mitigation Measure AIR-1** would limit air pollutants. During any necessary cleanup activities and remediation as well as construction, all requirements of federal and state laws regarding treatment and disposal of contaminated materials would be carried out . The Petaluma Fire Prevention Bureau regulates hazardous materials. If and when construction activities involve the on-site storage of potentially hazardous materials, a declaration form would be filed with the Fire Marshal's office and a hazardous materials storage permit would be obtained. Therefore, impacts related to the emission or handling of hazardous, or acutely hazardous materials, within one-quarter mile of an existing or proposed school would be less than significant.

Mitigation Measures

See **Mitigation Measure HAZ-1: Pre-Demolition Hazardous Material Survey and Abatement,** and **HAZ-2 Hazardous Materials Management Spill Prevention and Control Plan**, as described above.

Significance Determination

Less than significant with mitigation incorporated.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Regulatory records were searched through the State Water Resources Control Board (SWRCB) GeoTracker database (SWRCB n.d.) and the DTSC EnviroStor database (DTSC n.d.). The proposed project site does not fall within a site that is included on a recent or currently active clean-up or hazardous materials site per Government Code Section 65962.5. However, the proposed project site is adjacent to several closed Leaking Underground Storage Tank (LUST) sites. A LUST site is where permitted underground storage tank-related contamination has been discovered and a cleanup case has been created to address that contamination (SWRCB 2023). To close a LUST site, the responsible party must take 10 steps (CARWQCB 2007):

- Define the extent of soil contamination
- Locate wells properly and in adequate numbers to define the extent of groundwater contamination
- Construct monitoring wells properly
- Submit analytical and site data electronically
- Develop conceptual site model, identifying source area, receptors, and exposure pathways
- Provide performance data that demonstrate successful clean up

- Conduct post-clean up confirmation sampling
- Monitor and report groundwater data for an adequate period of time after cleanup
- Provide current land owner information
- Request closure and provide support documentation

Construction and operations associated with the proposed project would not create a significant hazard to the public or the environment through the release of existing materials related to a listed hazardous materials site because the responsible parties have taken the applicable steps in closing LUST sites and the proposed project site is not within recent or currently active clean-up or hazardous materials sites per Government Code Section 65962.5 (SWRCB 2022; DTSC 2021). **Mitigation Measure HAZ-1**, a Hazardous Materials Management Spill Prevention and Control Plan, would be used to mitigate hazards associated with newly identified contaminated soil or groundwater. The Hazardous Materials Management Spill Prevention and Control Plan would outline procedures for training, safety, and identification of contaminated media (soil, soil vapor, groundwater) during construction activities. With implementation of **Mitigation Measure HAZ-1,** these hazards would be reduced to less than significant.

Mitigation Measures

See **Mitigation Measure HAZ-1: Hazardous Materials Management Spill Prevention and Control Plan**, as described above**.**

Significance Determination

Less than significant with mitigation incorporated.

e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard or excessive noise for people residing or working in the Project Area?

The project is not located within the boundaries of an airport land use plan or located in close proximity to a public airport or public use airport. The closest airport is the Petaluma Municipal Airport, located approximately two miles from the project site. Therefore, no impacts associated with airport-related hazards are expected.

Mitigation Measures

None required.

Significance Determination

No impact.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The City of Petaluma Emergency Operations Plan provides the foundation for the management of emergencies and disasters within the City of Petaluma (City of Petaluma 2022). The Plan was developed according to the California Emergency Services Act and conforms to the Standardized Emergency

Management System. The Emergency Operations Plan applies to an extraordinary emergency associated with any hazard, natural, or human-caused event, which may affect the City and generate situations requiring planned, coordinated responses by the City with multiple agencies or jurisdictions (City of Petaluma 2022). Additionally, the City of Petaluma developed the Local Hazard Mitigation Plan to reduce or eliminate long-term risk to people and property from hazards (City of Petaluma 2020).

The proposed project would temporarily require partial road closures such that construction activities may conflict with the adopted emergency response plan and/or emergency evacuation plan. **Mitigation Measure TRA-1** would ensure that any temporary impacts to emergency vehicle flow and/or ingress/egress to properties along the project alignment are coordinated in advance with emergency service providers and law enforcement to ensure that provision of sufficient emergency service, access, and evacuation can occur during construction if necessary. Activities required during long-term operation and maintenance of the project would be incorporated into the City's existing operation and maintenance routine and would not be expected to affect emergency response. Implementation of **Mitigation Measure TRA-1** would reduce impacts to local emergency service providers and would avoid potential interference with an adopted emergency response plan or emergency evacuation plan during project construction. Impacts would be less than significant with mitigation.

Mitigation Measures

See **Mitigation Measure TRA-1 Traffic Control Plan,** as described below**.**

Significance Determination

Less than significant with mitigation.

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

The project site is not located in a CAL FIRE (CAL FIRE 2007) nor City of Petaluma Fire Department designated VHFHZs (City of Petaluma 2020). Additionally, the proposed project would involve the installation or maintenance of an underground pipeline and multi-use pathway, which are not infrastructure that is typically associated with fire risk. However, the eastern portion of the project area is within a moderate fire hazard severity zone within the City LRA (City of Petaluma 2020). The project would involve the use of construction equipment that could spark a fire in grassland areas designated as a moderate fire hazard severity zone. Therefore, the City will require its construction contractor to implement **Mitigation Measure FIR-1**, which requires fire prevention and protection measures during construction. With mitigation, the risk of loss due to wildfires caused by project construction would be less than significant.

The proposed project would include construction of a multi-use pathway that would attract people to an area designated as a moderate fire hazard severity zone. However, use of the pathway by recreational users is not expected to expose people to substantial wildfire risk because the project area is served by many existing roadways that would be used to evacuate the area in the event of a fire. Any damage to the path during a fire would be readily repairable. Therefore, there would be less than significant impacts associated with the exposure or people or structures either directly or indirectly to a significant risk of loss, injury or death involving wildland fires.

Mitigation Measures

None required.

Significance Determination

Less than significant.

3.10 Hydrology and Water Quality

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	[ ]	[ ]	[X]	[ ]
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?	[ ]	[ ]	[X]	[ ]
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i) result in substantial erosion or siltation on- or off-site;	[ ]	[ ]	[X]	[ ]
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	[ ]	[ ]	[X]	[ ]

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	[ ]	[ ]	[X]	[ ]
iv) impede or redirect flood flows?	[ ]	[ ]	[X]	[ ]
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	[ ]	[ ]	[X]	[ ]
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	[ ]	[ ]	[X]	[ ]

Discussion

Surface Water

The proposed project is located in the Petaluma River Watershed. The Petaluma Watershed is approximately 19 miles long and 46 square miles. Tributaries to the Petaluma River include Petaluma Creek, Willow Brook Creek, Lichau Creek, Liberty Creek, Marin Creek, Wiggins Creek, Wilson Creek, Corona Creek, Capril Creek, Lyncg Creek, Washington Creek, East Washington Creek, Thompson Creek, Kelly Creek, and Adobe Creek (City of Petaluma 2006).

Surface water quality in Petaluma is regulated by the San Francisco Regional Water Quality Board (RWQCB) via the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan). The RWQCB is responsible for implementing Section 401 of the Clean Water Act through the issuance of a Clean Water Certification when development includes potential impacts to jurisdictional areas such as creeks, wetlands, or other Waters of the State. The Basin Plan identifies existing and potential beneficial uses for surface and groundwaters, and provides numerical and narrative water quality objectives designed to protect those uses.

Section 402 of the Clean Water Act regulates the discharge of pollutants to waters of the United States. Locally, this is implemented through the NPDES General Permit. Requirements apply to the project's construction activities (e.g. grading, grubbing, and other site disturbance). Construction activities disturbing one or more acres are subject to NPDES construction permitting requirements, including the preparation of a SWPPP. Additionally, certain municipal activities and new development are regulated under an NPDES municipal separate storm sewer system (MS4) permit.

Sonoma Water, formerly Sonoma County Water Agency, manages flood control facilities throughout the County, including flood Zone 2A, within which the entire City of Petaluma is located. Sonoma Water is responsible for structural repairs to culverts and spillways, grading and reshaping channels, and debris removal to maintain hydraulic capacity of all waterways within Zone 2A. Sonoma Water has authority for stream maintenance in McDowell Creek, Adobe Creek, and Ellis Creek (Sonoma Water 2023). Stream maintenance includes managing riparian vegetation, removing sediment and garbage, and planting trees.

The Petaluma River is the primary watercourse within the City of Petaluma and the Petaluma watershed. The Petaluma River is tidally influenced and flows in a southeast direction into San Pablo Bay. The Petaluma River is used for recreational boating and water sports as well as river-dependent industrial operations. Periodic dredging of the Petaluma River is necessary to maintain navigability for commercial shipping.

The Federal Emergency Management Agency's (FEMA's) flood hazard mapping program provides guidance for the City in planning for flooding events and regulating development within identified flood hazard areas. FEMA's National Flood Insurance Program is intended to encourage State and local governments to adopt responsible floodplain management programs and flood measures. As part of the program, the FEMA defines floodplain and floodway boundaries that are shown on the Flood Insurance Rate Maps (FIRMs). As shown on the FIRM panels numbered 0609C1001G and 06097C1002G, portions of the project are in Zone AE Special Flood Hazard Area (SFHA), other portions of the project are in Zone X areas mapped as having a 0.2 percent annual chance of flood, and other portions of the project area are outside of flood hazard areas.

Because portions of the project site are located within the boundaries of a SFHA as defined by FEMA, the project is subject to provisions of the City's municipal code and Zoning Ordinance. Section 6.013 of the Zoning Ordinance, Methods of Reducing Flood Losses, includes the following methods and provisions to reduce flood losses in the City of Petaluma:

- Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
- Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;
- Controlling filling, grading, dredging, and other development which may increase flood damage; and
- Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards in other areas.

Groundwater

The City of Petaluma's central and eastern lands are situated above the Petaluma Valley Groundwater Basin as identified by the California Department of Water Resources Bulletin 118 Groundwater Basins published in 2018. The State of California adopted the Sustainable Groundwater Management Act (SGMA) in 2014, which called for the creation of local Groundwater Sustainability Agencies to develop and implement Groundwater Sustainability Plans for the long-term management of a healthy and functioning groundwater resource. In 2018, the Petaluma Valley Groundwater Sustainability Agency (PVGSA) was formed from representative government agencies, including the City of Petaluma, to begin assessing baseline conditions, defining sustainability for the basin, and developing a Groundwater Sustainability Plan (GSP) and corresponding projects. The GSP was submitted to the California Department of Water Resources (DWR) and approved on January 26, 2023 (Sonoma Water 2021). The GSP establishes a standard for sustainability of groundwater management and use and determines how the basin will achieve this standard by 2042. The indicators for adverse impacts to the groundwater basin include lowering groundwater levels, sea water intrusion, reduction of storage, land subsidence, degraded groundwater quality, and surface water depletion. The PVGSA implements projects that demonstrate improvements to groundwater sustainability, with the goal of maintaining sustainability 50 years into the future.

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

PIPS Parallel Force Main

Prior to construction, the City would be required to file for coverage under the State Water Resources Control Board (SWRCB) for Discharges of Storm Water Runoff Associated with Construction Activity (Construction General Permit). The mandatory requirements of the NPDES General Permit apply to the project's construction and post-construction storm water discharges and potential discharge of dewatering water to the Petaluma River. All discharges of dewatering water would be conducted in accordance with Regional Board permitting requirements. Petaluma is also covered under the Phase II Small MS4 general permit dated February 5, 2013, and last amended January 1, 2019, Order # 2013-0001 DWQ for post construction water regulations.

Mandatory requirements cover construction activities including, but not limited to, clearing, grading, excavation, stockpiling, dewatering and reconstruction of existing facilities involving removal and replacement of impervious surfaces (e.g., asphalt). Compliance is initiated through submittal of a Notice of Intent (NOI) to the SWRCB and carried out through a SWPPP. The SWPPP is required to contain a site map, existing and proposed buildings, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The City would implement BMPs for erosion control during construction activities as required by the City's grading and erosion control ordinance (Chapter 17.31 of the Municipal Code). Measures would be implemented to ensure that dewatering discharges meet receiving water limits. Dewatering water would be monitored for pH and turbidity to ensure that discharges are of appropriate quality. As noted above in Section 3.9, Hazards and Hazardous Materials, there is no known groundwater contamination in the vicinity of the project area, so groundwater quality is expected to meet requirements for discharge.

Construction activities have the potential to result in runoff that contains sediment and other pollutants that could degrade water quality if not properly controlled. Sources of potential pollution associated with construction include fuel, grease, oil and other fluids, concrete material, sediment, and litter. These pollutants have the potential to result in impacts due to chemical contamination from the presence of construction equipment and materials that could pose a hazard to the environment or degrade water quality if not properly managed. Compliance with these permits and regulations, including implementation of the SWPPP, would ensure construction of the new sewer force main would not violate water quality standards or waste discharge requirements, nor significantly degrade surface water quality. Impacts on surface water quality would be less than significant.

Operation of the project would distribute wastewater through the new sewer force main in the event the existing PIPS force main is taken offline for maintenance. There would be no substantive change in the type of pollutants associated with the operation of the proposed project compared to existing conditions. Because the project infrastructure would all be underground and the site would be returned to existing surface conditions, storm water would flow into the existing storm water system, as it does now. No impacts on surface water quality would occur.

Multi-Use Pathway

The 2,100-linear-foot multi-use pathway would be constructed between Marina Avenue and Casa Grande Road. Recommended surfaces for multi-use trails are concrete, asphalt, and crushed stones mixed with stabilizing agents. Existing Class 1 bikeways to the west and east of the proposed multi-use pathway are paved. It is assumed that the proposed multi-use pathway would be paved with asphalt. If not controlled, asphalt installation can contaminate storm water and downstream rivers, lakes, and streams with suspended solids, toxic hydrocarbons and other chemicals, oils, greases, and heavy metals. As discussed above, the City would comply with the requirements of the NPDES Construction General Permit and implement a SWPPP, which would identify BMPs to control construction-related pollutants in storm water discharge. Typical BMPs include housekeeping practices such as proper waste disposal, covering stockpiles with tarps, containment of building materials, and inspection of construction vehicles to prevent leaks or spills.

Water quality of post-construction storm water runoff from the multi-use pathway would be regulated under the existing Phase II Small MS4 General Permit (Order 2013-0001-DWQ NPDES NO. CAS000004 as Amended by Order WQ 2015-0133-EXEC, Order WQ 2016-0069-EXEC, WQ Order 2017-XXXX-DWQ, Order WQ 2018-0001-EXEC, and Order WQ 2018-0007-EXEC). Because the multi-use pathway would create over 5,000 square feet of new impervious surface, the project would be required to comply with the Phase II Small MS4 requirements for post construction storm water management. If the pathway were constructed to direct storm water to adjacent, vegetated, or otherwise non-erodible permeable areas, it could qualify for an exclusion from the post construction storm water management requirements of the Phase II Small MS4 General Permit. If the requirements apply to the multi-use pathway, these requirements include incorporation of low impact development design standards into the project to control and treat site runoff. A project-specific storm water control plan would be prepared and would include site design, source control, runoff reduction, storm water treatment and baseline hydromodification management measures. Prior to the start of construction, the storm water control plan would be reviewed and approved by the City's engineering staff to ensure the project meets design requirements of the Phase II Small MS4 Permit. Thus, compliance with the Phase II Small MS4 General Permit requirements and Construction General Permit, including implementation of a storm water control plan and SWPPP, respectively, would ensure that the multi-use pathway would not violate water quality standards or waste discharge requirements, nor significantly degrade surface water quality. Impacts on surface water quality would be less than significant.

Mitigation Measures

None required.

Significance Determination

Less than significant.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?

PIPS Parallel Force Main

The City of Petaluma has historically used surface water, groundwater, and recycled water supplies to meet customer demands. The near-term supply strategy of the 2020 Urban Water Management Plan (UWMP) relies on surface water from Sonoma Water and recycled water from the City's ECWRF. The City has decreased groundwater use since 2015 and is only using groundwater for short term scenarios. The City intends to only use groundwater in the future for emergency backup supply, to meet peak demands, or for other short-term scenarios. As discussed in *Section 3.14 Population and Housing,* the proposed project would provide redundancy for the existing wastewater collection system, which provides wastewater conveyance for planned future growth that would occur with or without the project. The project would not induce population growth or increase water demands that would require additional groundwater pumping. Operation of the project does not require potable or non-potable water, meaning the use of water would be limited to temporary construction activities such as dust control.

The Petaluma Valley Groundwater Basin GSP identifies a range of projects to ensure a sustainable groundwater supply. Projects focus on reducing groundwater use, but also storm water capture and recharge, and aquifer storage and recovery (Sonoma Water 2021). After installation of the new sewer force main, the project alignment would be restored to existing conditions, and would not result in a change in impervious surface area affecting the ability of rainfall to recharge the groundwater basin. Therefore, the proposed project would not substantially decrease groundwater supplies or interfere with groundwater recharge efforts. There would be no impact.

Multi-Use Pathway

The multi-use pathway would result in a change in impervious surfaces because it is assumed that a paved surface would be installed between Marina Avenue and Casa Grande Road. However, the additional impervious surface would be limited in area and would not significantly interfere with groundwater recharge from runoff. Additionally, operation and maintenance of the multi-use activities pathway would not involve any groundwater extraction. Thus, the project would not result in lowering of the aquifer or the local groundwater table.

As discussed in *Section 3.14 Population and Housing,* the multi-use pathway would serve the City's existing population and planned future growth that would occur with or without the project. The multi-use pathway would not induce population growth or increase water demands that would require additional groundwater pumping. Therefore, the proposed project would not be expected to substantially decrease groundwater supplies or interfere with groundwater recharge efforts. There would be a less than significant impact.

Mitigation Measures

None required.

Significance Determination

Less than significant.

c.i) Substantially alter the existing drainage pattern of the site 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: result in substantial erosion or siltation on- or off-site?

PIPS Parallel Force Main

The new sewer force main would be constructed under McDowell Creek and Adobe Creek and would not change their drainage pattern. The pipeline would be constructed within existing streets, parking lots, vacant land, dirt pathways, and commercial and industrial developments, which would be restored to pre-construction conditions, and thus would not permanently increase total impervious surface area.

Woodard & Curran

Project construction may result in disturbance or exposure of soil that could be subject to erosion and sedimentation during a rain event. However, implementation of SWPPP and BMPs as required by the NPDES Construction General Permit would limit erosion and sedimentation.

As a result, the proposed project would not alter the existing drainage pattern of the project area in a manner which would result in substantial erosion or siltation on- or off-site. Therefore, the proposed project would have a less than significant impact.

Multi-Use Pathway

The multi-use pathway would increase impervious surfaces because it would install a paved asphalt surface between Marina Avenue and Casa Grande Road. However, the project is not expected to substantially alter the existing drainage of the site or area because new impervious surfaces would be limited to the area between Marina Avenue and Casa Grande Road. Construction may result in disturbance or exposure of soil that could be subject to erosion and sedimentation during a rain event, but implementation of SWPPP and BMPs required by the NPDES Construction General Permit would limit erosion and sedimentation. Therefore, the proposed project would not significantly alter the existing drainage pattern of the project area in a manner which would result in substantial erosion or siltation on- or off-site. The proposed project would have a less than significant impact.

c.ii) Substantially alter the existing drainage pattern of the site 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: substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

PIPS Parallel Force Main

As described in the Hydrology and Water Quality Discussion, portions of the new sewer force main are located within the boundaries of a SFHA and/or in 0.2 percent Annual Chance Flood Hazard zone. However, the project would not result in new impervious surfaces because construction of the new sewer force main includes installation of underground sewer pipelines and surface conditions would be restored to pre-project conditions, except for the segment of the force main that would be overlaid with the multi-use path, discussed below. Thus, the rate or amount of surface runoff would not increase as a result of the project. As a result, the proposed project would not alter the existing drainage pattern of the site area in a manner that would result in flooding on- or off-site and the impact would be less than significant.

Multi-Use Pathway

The multi-use pathway would increase the rate or amount of surface runoff because new impervious surfaces would be constructed to complete the 2,100-linear-foot path between Marina Avenue and Casa Grande Road. However, this new impervious surface area is not a substantial increase to impervious surface in the local area overall, and thus the project is not anticipated to substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site, The multi-use pathway would be built adjacent to relatively recent (i.e., within the last 30 years) commercial development, built with adequately sized storm drain facilities that would accommodate the slight increase in surface runoff from the path. Therefore, the project would have a less than significant impact.

c.iii) Substantially alter the existing drainage pattern of the site 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: 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?

PIPS Parallel Force Main

As discussed in *c,i, and cii*, above, the proposed project would not substantially increase surface runoff or alter the existing drainage pattern of the site area in a manner that would create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. In addition, all construction activities would be conducted in accordance with BMPs specified in the construction SWPPP to reduce impacts to pollutants in storm water discharges. Also, because the project would collectively improve older infrastructure, the risk of incidental release of sewage would be reduced compared to existing conditions. Therefore, the proposed project would have a less than significant impact.

Multi-Use Pathway

As discussed in *c.i* and *c.ii*, the 2,100-linear-foot multi-use pathway would not increase surface runoff or alter the existing drainage pattern of the site area in a manner that would create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems. The new impervious surface area could create additional sources of polluted runoff. However, all construction activities would be implemented in accordance with the SWPPP to reduce impacts to pollutants in storm water discharges. Additionally, the project would be required to comply with the post-construction storm water management measures of the Phase II Small MS4 General Permit, which includes provisions to ensure that storm water runoff would not degrade water quality. Therefore, the proposed project would have a less than significant impact with mitigation incorporated.

c.iv) Substantially alter the existing drainage pattern of the site 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: impede or redirect flood flows?

PIPS Parallel Force Main

The new sewer force main would not increase impervious surfaces or pass above or through an existing stream or river. Although portions of the new sewer force main are in SFHA and/or in a 0.2 percent Annual Chance Flood Hazard zone, the project is not expected to result in new impervious surfaces because construction of the new force sewer main would be underground and all surfaces would be restored to pre-construction conditions, except for the segment of the force main that would be overlaid with the multi-use path, discussed below. As a result, the proposed project would not alter the existing drainage pattern of the site area in a manner that impedes or redirect flood flows and would have no impact.

Multi-Use Pathway

As described in responses *c.i, c.ii,* and *c.iii,* the multi-use pathway would result in new impervious surfaces because the project would install paved asphalt surfaces. However, the multi-use pathway is not expected to significantly alter the existing drainage pattern of the site area in a manner that would impede or redirect flood flows because the new impervious surfaces would not be substantial and would be limited to a small linear area between Marina Avenue and Casa Grande Road. Therefore, the project would not substantially alter the existing drainage pattern of the site area in a manner that would impede or redirect flood flows and impacts would be less than significant.

Mitigation Measures

None required.

Determination

Less than significant..

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?

PIPS Parallel Force Main

A tsunami is a large ocean wave, caused by earthquakes or major ground movement, and a seiche is a large wave generated in an enclosed body of water, which is also caused by an earthquake. The City of Petaluma General Plan 2025 states that the City is not at risk from tsunamis and seiches because there are neither any lakes nor reservoirs where a seiche can form nor is the City near enough to the ocean or the San Francisco and San Pablo bays (City of Petaluma 2008). However, according to the California Geological Survey Tsunami Hazard Area mapping tool, portions of the new sewer force main are located within a tsunami hazard area (CDOC 2022b). As stated in responses *c.i, c.ii, c.iii*, and *c.iv,* portions of the new sewer force main are in a flood hazard zone. However, the new sewer force main would be installed below existing roadways which would be resurfaced after construction, so there would no risk of floods, tsunamis, or seiches inundating the project and potential for release of pollutants is low. Therefore, the impacts would be less than significant.

Multi-Use Pathway

According to the Tsunami Hazard Area mapping tool, much of the multi-use pathway is in a tsunami hazard area (CDOC 2022b), and, as stated in responses *c.i. c.ii*, and *c.iii,* the multi-use pathway is also in a flood hazard zone. It is assumed that the multi-use pathway would be paved with asphalt surfaces. During construciton, asphalt installation can contaminate storm water and downstream rivers, lakes, and streams with high concentrations of suspended solids, toxic hydrocarbons and other chemicals, oils, and greases, and heavy metals. However, all construction activities would be implemented in accordance with the SWPPP, including BMPs to reduce the potential of pollutants release due to project inundation during construction. There would be no long-term risks associated with the use of asphalt as a paving material. Therefore, the risk of floods, tsunamis, or seiches inundating the project and potential release of pollutants is low. Impacts would be less than significant.

Mitigation Measures

None required.

Significance Determination

Less than significant.

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

PIPS Parallel Force Main

As noted previously, the Basin Plan sets water quality objectives for the project site. Water quality thresholds identified in the Basin Plan are intended to reduce pollutant discharge and ensure that water bodies are of sufficient quality to meet their designated beneficial uses. The proposed project would not conflict with the water quality standards outlined in the Basin Plan. As discussed above, pollutant discharge during construction would be avoided via compliance with the Construction General Permit and SWPPP and NPDES permits for construction dewatering, if needed. Additionally, **Mitigation Measure HAZ-1** would minimize the risk of hazardous material accidentally entering waterways by requiring the City and its construction contractor to develop a Hazardous Materials Management and Spill Prevention and Control Plan to ensure project-specific contingencies are in place. Once operational, the project would convey wastewater through the City's sanitary sewer system in the event the existing PIPS sewer force main is taken offline. The project would not discharge extracted or treated water or be a source of pollutants for downstream water bodies. Therefore, the proposed project would not conflict with the Basin Plan.

As previously discussed, the Petaluma Valley Groundwater Basin is being managed for groundwater sustainability under the GSP. The GSP establishes a standard for sustainability of groundwater management and use and determines how the basin will achieve this standard by 2042. The purpose of this project is to provide redundancy for the City's sewer sanitary system. The project does not involve the extraction of groundwater nor would it result in any increase in impervious surfaces that could affect groundwater recharge, and thus, the project would not impact groundwater sustainability. Therefore, the project would not conflict with applicable water quality control plans or groundwater management plans. Impacts would be less than significant.

Multi-Use Pathway

As previously discussed, the multi-use pathway could result in new impervious surfaces because it is assumed the 2,100-linear-foot pathway between Marina Avenue and Casa Grande Road would be paved with asphalt surfaces. The project would not conflict with the Basin Plan because new impervious surfaces would be limited to between Marina Avenue and Casa Grande Road. Additionally, all construction activities would be implemented in accordance with the Construction General Permit and SWPPP, including BMPs, to minimize impacts of pollutants in storm water discharges, and the site would be designed in accordance with the post-construction storm water management measures of the Phase II Small MS4 general permit to control water quality in site runoff. Furthermore, **Mitigation Measure HAZ-1** would minimize the risk of hazardous material accidentally entering waterways by requiring the City and its construction contractor to develop a Hazardous Materials Management and Spill Prevention and Control Plan to ensure project-specific contingencies are in place. Thus, the project would not conflict with applicable water quality control plans.

The project does not involve the extraction of groundwater and the City would not rely on groundwater for operation and maintenance activities. Although the project could result in new impervious surfaces, the project would not degrade water quality because all construction activities would be implemented in accordance with the Construction General Permit and SWPPP, the Phase II Small MS4 General Permit,, and **Mitigation Measure HAZ-1,** which would reduce impacts of pollutants in storm water discharge that could enter the groundwater. Therefore, the project would not conflict with sustainable groundwater management plans, and impacts would be less than significant.

Mitigation Measures

None required.

Significance Determination

Less than significant impact.

3.11 Land Use and Planning

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

Discussion

The proposed project is located in the City of Petaluma. Land use in the City of Petaluma is guided by the City of Petaluma General Plan 2025 Land Use, Growth Management, and the Built Environment Element, which provides the General Plan land use classification system, information on population and projected buildout, citywide land use policies, and policies on pacing growth (City of Petaluma 2008). The City of Petaluma also provides specific land use and development guidelines for the area bounded by Lakeville Street on the east and north, Petaluma Boulevard on the west, and Highway 101 on the south, an area that encompasses the PIPS and western portion of the proposed project, in the Central Petaluma Specific Plan (City of Petaluma 2003).

PIPS Parallel Force Main

Per the City of Petaluma Zoning Map (City of Petaluma n.d.), parcels that overlay and are adjacent to the new sewer force main are zoned as mixed use, residential, open space-park, business park, commercial, and planned community developments. Portions of the new sewer force main would be within the Central Petaluma Specific Plan. The Specific Plan parcels that overlay and are adjacent to the new sewer main are zoned river dependent industrial district, civic space, urban center, and urban core. The project area does not include any area along the Petaluma River that is zoned as floodway.

Multi-Use Pathway

The proposed multi-use pathway between Marina Avenue and Casa Grande Road is a planned component of the City of Petaluma Bicycle and Pedestrian Plan, which is an appendix to the City of Petaluma General Plan 2025. The purpose of the City of Petaluma Bicycle and Pedestrian Plan is to make the City a pedestrian and bicycle friendly community by means of complete streets, infrastructure improvements, and transportation planning for the benefit to all (City of Petaluma 2008c). According to the City of Petaluma Zoning Map, parcels that overlay and are adjacent to the multi-use pathway are classified as mixed use, commercial, residential, planned community development, and open space parks. The multi-use pathway also falls within the mapped 100 Year Floodplain but is outside the area along the river zoned as floodway.

a) Physically divide an established community?

PIPS Parallel Force Main

The new sewer force main would approximately follow the alignment of the existing City force main, which is located under streets, parking lots, vacant land, and, in some cases, very close to buildings. The proposed project would be constructed within existing dirt pathways, parking lots, vacant land, and commercial and industrial developments. It would temporarily require lane closures that would impact access to adjacent communities. However, no streets would be fully closed and continued access to established communities and business would be maintained during construction (see *Section 3.17 Transportation*). Additionally, impacts would not permanently affect the existing surrounding established communities because the new sewer force main would be constructed belowground, and all pipeline and maintenance access structure construction areas would be restored to pre-construction conditions after construction is complete. The temporary construction staging areas would be located at the PIPS and ECWRF or a private property, but the selected contractor would be required to obtain temporary easements, thus minimizing the temporary impacts on private property. The new sewer force main would not permanently result in a physical barrier within the existing community. Therefore, the new sewer force main would have a less than significant impact related to physically dividing an established community.

Multi-Use Pathway

The multi-use pathway would be constructed between Marina Avenue and Casa Grande Road. Existing bikeways to the west and east of the proposed multi-use pathway are already present. It is anticipated that the proposed multi-use pathway would consist of a 12-foot-wide path, paved with asphalt, with 3-foot shoulders on either side. The construction of the multi-use pathway may require temporary lane closures on Marina Avenue and Casa Grande Road. However, no streets would be fully closed and continued access to established communities and businesses would be maintained during construction. In addition, the multi-use pathway would not physically divide the existing surrounding neighborhood because the pathway would allow new access and connectivity for pedestrian and bicycle circulation. Therefore, the multi-use path would have less than significant impact related to physically dividing an established community.

Mitigation Measures

None required.

Significance Determination

Less than significant impact.

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

PIPS Parallel Force Main

The new sewer force main would create redundancy in sewer service in the event the existing PIPS force main must be taken offline. The new sewer main would help meet existing and projected demand for wastewater conveyance, as planned for in the City of Petaluma General Plan 2025. The new sewer force main line would parallel the existing City force main, except in one location to avoid construction across residential areas, and would acquire the necessary easements and permits for construction and staging areas. Construction and operation of the project would not require or result in changes to land use or zoning designations.

The City of Petaluma General Plan 2025 and zoning regulation allow for construction within the 100-year floodplain, provided that specific standards are met, and development does not increase the potential for flooding. Per section 6.070(G)4 of the Zoning Ordinance replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the system and discharge from systems into floods waters. The average and peak design capacities of the existing PIPS sewer force main are 8 and 36 million gallons per day (MGD), respectively (Woodard & Curran 2023). During heavy rainfall events, the existing PIPS sewer force main has been able to slightly exceed its 36 MGD peak capacity when all four 450-hp pumps operate at 100-percent speed. The peak design flow for the new sewer force man would be based on flow data from a peak event; thereby, minimizing the potential for discharge from the proposed system into flood waters. Construction and operation of the project would not conflict with the City of Petaluma land use plans, zoning policies, or regulations.

Multi-Use Pathway

The project would construct a 2,100-foot-long Class 1 off-street multi-use bicycle pathway between Marina Avenue and Casa Grande Road. According to the City of Petaluma's zoning map, the multi-use pathway would be within open space-park and mixed use zones. The multi-use path would be designed and constructed to conform with the standards of Chapter 1000 of the California Highway Design Manual (CA Department of Transportation 2000), which is cited in the City of Petaluma Bicycle and Pedestrian Plan. Therefore, the multi-use pathway is in full compliance with the City's Bicycle and Pedestrian Plan. The multi-use pathway would also expand the City's pedestrian and bicycle facilities to serve alternative transportation needs and would be consistent with the following City of Petaluma General Plan 2025 goals:

- **Goal 5-G-1:** To improve Petaluma's mobility system to increase efficiency for all modes of travel
    - **Policy/ Program 5-P-1:** Develop an interconnected mobility system that allows travel on multiple routes by multiple modes.
- **Goal 5-G-5:** Create and maintain a safe, comprehensive, and Integrated bicycle and pedestrian system throughout Petaluma that encourages bicycling and walking and is accessible to all
    - **Policy/ Program 5-P-15:** Implement the bikeway system as outlined in the Bicycle Pedestrian Plan, and expand and Improve the bikeway system wherever the opportunity arises.

- **Policy/ Program 5-P-25:** Establish a network of multi-use trails to facilitate safe and direct off-street bicycle and pedestrian travel. At the minimum, Class I standards shall be applied unless otherwise noted

The multi-use pathway is within the 100-year floodplain. Per Section 6.050(C)1 of the Zoning Ordinance, open air public and private recreational facilities such as parks, golf courses, and athletics fields may be permitted after approval of a conditional use permit by the City of Petaluma. The City of Petaluma would obtain the applicable permits to ensure the project does not conflict with an applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

Mitigation Measures

None required.

Significance Determination

Less than significant.

3.12 Mineral Resources

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

Discussion

The Surface Mining and Reclamation Act of 1975 (SMARA) mandates a process for classification and designation of lands containing potentially important mineral deposits. SMARA requires the California Geological Survey State Geologist to classify specified areas in Mineral Resource Zones (MRZs). These MRZs are based on geological appraisals, which include the use of literature, geological maps, and publications and date from the CDOC Division of Mines and Geology, U.S. Geological Survey, the former US Bureau of Mines, and the US Bureau of Land Management. In 2013, the California Geological Survey, updated the mineral land classification on aggregate resources in the North San Francisco Bay Production-Consumption Region, which includes Sonoma County (Miller and Busch 2013). In this report, an area can be classified as:

- MRZ-1: Areas where available geologic information indicates that little likelihood exists for the presence of significant mineral resources.
- MRZ-2: Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood for their presence exists.
- MRZ-3: Areas containing mineral occurrences of undetermined mineral resource significance.
- MRZ-4: Areas where available information is inadequate for assignment to any other MRZ category.

The majority of the City of Petaluma was classified as MRZ-3, while a smaller portion was classified as MRZ-1; there are no operating quarries within the City of Petaluma (CDOC 2016).

a-b) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

The California Geological Survey has not identified significant mineral resources within the City of Petaluma (Miller and Busch 2013). The common minerals found in the City of Petaluma are sandstone, mudstone, and basalt (Miller and Busch 2013). There is also a 112-acre area underlain by Franciscan Complex rocks, about 2.5 miles southeast of the City of Petaluma (Miller and Busch 2013). The estimated resource is 23 million tons of subbase-grade aggregate, and the reserve total is proprietary (Miller and Busch 2013). The City of Petaluma General Plan 2025 has not identified these common minerals as locally-important. The proposed project site is not currently used as a mineral resource recovery site and the project would not involve mining or the production of mineral resources. No impact on the availability of a known mineral resource or availability of a locally-important mineral resource recovery site would occur as a result of construction or operation of the project.

Mitigation Measures

None required.

Significance Determination

No impact.

3.13 Noise

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

<u>Discussion</u>

Noise and Vibration Overview

Noise is generally defined as unwanted sound. Sound travels in the form of waves from its source, exerting a sound pressure level (referred to as "sound level") that is measured in decibels (dB). Decibels are measured on a logarithmic scale because sound pressure varies widely within the range of human hearing. Because the human ear is not equally sensitive to all sound levels, noise measurements are weighted more heavily for the frequencies that correspond to the human ear's decreased sensitivity to extremely low and high sound levels. This method of frequency weighting is referred to as A-weighting and the units of measure are A-weighted decibels, or dBA.

Noise levels are measures of noise at a given instant in time. Environmental noise levels fluctuate over time, depending on the sources of sound that contribute to the community noise environment. Background noise levels change throughout a typical day, based on the changes in sources such as traffic, and on the addition of short-duration, single-event noise sources such as aircraft flyovers, emergency vehicle sirens, and nearby noisy motor vehicles. The time-varying characteristic of environmental noise is typically described using statistical noise descriptors such as:

- L_{eq}, used to describe noise over a specified period of time in terms of a single value, also referred to as the "average" sound level.
- L_{max}, the maximum instantaneous noise level measured over a specified period of time.
- L_{dn}, also called the day-night average noise level, averaging the A-weighted noise level during a 24-hour day, after an addition of 10dB to measured noise levels between the hours of 10 p.m. and 7 a.m. to account for greater nighttime noise sensitivity.
- CNEL, "Community Noise Equivalent Level," similar to L_{dn} but also includes an addition of 5 dB to measured noise levels between 7 a.m. and 10 p.m. after the addition of 10 dB to the measured noise levels between 10 p.m. and 7 a.m. to account for greater noise sensitivity in the evening and nighttime.

For a stationary point-source, sound typically attenuates (decreases) at a rate of 6 dB for each doubling of distance (e.g., a sound level of 80 dB at 50 feet would reduce to 74 dB at 100 feet and 68 dB at 200 feet). For a line source such as traffic on a roadway, sound attenuates at a rate of approximately 3 dB for each doubling of distance for hard sites and 4.5 dB for soft sites (e.g., grass or scattered bushes and trees). Barriers such as buildings that block line of sight between the sound source and the receiver increase the attenuation of sound over an equivalent distance.

The effects of noise on people range from annoyance and interference with speech to sleep disturbance, and under extremely noisy conditions, hearing impairment. There is a wide variation in the sound levels that cause annoyance in different receivers, depending in part on the existing (ambient) noise level. Except in carefully controlled laboratory environments, a change of 1 or 2 dBA cannot be perceived. In a typical environment, a change of 3 dBA is a barely perceptible difference, a change of 5 dBA is readily perceptible, and a change of 10 dB is generally perceived as a doubling of loudness.

Groundborne vibration may occur when heavy equipment or vehicles create vibrations in the ground, which can then propagate through the ground to buildings, creating a low-frequency sound. Groundborne vibrations can be a source of annoyance to humans due to a "rumbling" effect, and such vibrations may also cause damage to buildings. Groundborne vibration is discussed in terms of these impacts on humans and structures. The annoyance potential of groundborne noise is typically characterized by the A-weighted sound level. Due to its low frequency, groundborne noise sounds louder than airborne noise at the same noise level; therefore, the impact thresholds for groundborne noise are typically lower than those for airborne noise. The following vibration terminology have been adapted from the FTA's Transit Noise and Vibration Impact Assessment Manual (FTA 2018):

- Vibration Decibels (VdB). The vibration velocity level in decibel scale.
- Peak Particle Velocity (PPV). The peak signal value (maximum positive or negative peak) of the vibration signal. PPV is often used in monitoring of construction vibration (such as blasting) because it is related to the stresses that are experienced by buildings and is not used to evaluate human response. PPV is usually expressed in inches per second in the United States.

Existing Conditions

The project is located entirely within the City of Petaluma, adjacent to industrial, commercial, residential, recreational, and educational uses. Residential and educational land uses are noise-sensitive uses that could be affected by short-term construction. Residential uses are as close as 25 feet to 100 feet from proposed pipeline segments along Baywood Drive, Casa Grande Road, and Technology Lane. Educational uses in the project vicinity include River Montessori Charter School, approximately 50 feet from the project area. Refer to **Figure 3-2** for an illustration of sensitive receptor locations relative to the pipeline alignments.

The primary noise sources in the vicinity of the project components include vehicles on adjacent roadways, residential sounds, and voices of nearby residents. To characterize the existing ambient noise environment in the project vicinity, short-term (15-minute) ambient noise level measurements were collected at locations adjacent to the pipeline alignments (see **Figure 3-2** for an illustration of the noise measurement locations). These locations were chosen to best represent the ambient noise environments at the closest noise-sensitive uses to the pipeline alignments. The short-term measurements are characterized in terms of the equivalent sound level (L_{eq}) to describe noise over a specified period, in terms of a single numerical value that is the constant sound level which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period, in this case 15 minutes); as well as the L_{max} and L_{min}, which represent the instantaneous maximum and minimum noise levels, respectively, measured during the 15-minute measurement periods. **Table 3-5** shows the results of the short-term noise monitoring survey. As shown in Table 3.13-1, L_{eq} noise levels ranged from approximately 55 dBA to 68 dBA, L_{max} noise levels ranged from approximately 69 dBA to 82 dBA, and L_{min} noise levels ranged from approximately 39 to 60 dBA.

Figure 3-2: Noise Measurement Locations

Table 3-5: Measured Short-term Ambient Noise Measurement Results

No.	Location Description	Time Period	Noise Level (dBA) L_{eq}	Noise Level (dBA) L_{max}	Noise Level (dBA) L_{min}	Sources
ST-1	Northeast corner Courtyard by Marriott	9:51 a.m. – 9:56 a.m.	64.5	75.0	60.3	Traffic on U.S. 101 about 450 feet from meter.
ST-2	North of Marina Crossing Apartments	11:14 a.m.– 11:30 a.m.	62.0	71.6	50.5	Traffic on SR 116.
ST-3	End of Casa Grande Road, southwest entrance Azure Apartment Homes	11:35 a.m.– 11:51 a.m.	56.9	73.3	43.8	Traffic on Casa Grande Road. Trucks entering across from Azure Apartments on Casa Grande Road.
ST-4	Casa Grande Road/ Technology Lane	11:54 a.m. – 12:10 p.m.	62.7	77.9	48.8	Traffic on Casa Grande Road and Technology Lane.
ST-5	Technology Lane/ Telecom Lane	12:14 p.m. – 12:29 p.m.	58.9	73.7	41.7	Traffic on Technology Lane and Telecom Avenue.
ST-6	End of Technology Lane, southeast entrance Azure Apartment Homes	1:19 p.m. – 1:34 p.m.	68.2	82.0	50.8	Traffic on Technology Lane. Truck idling on 1450 Technology Lane.
ST-7	Southeast corner of River Montessori Charter School	12:49 p.m. – 1:04 p.m.	54.5	69.0	39.3	Voices of children playing on school grounds and bird vocalizations.

NOTES:
dBA = A-weighted decibels; L_{eq} = equivalent sound level; L_{max} = maximum sound level; L_{min} = minimum sound level.
Measurements were short-term, collected over 15-minute periods on Tuesday, September 12, 2023.
SOURCE: ESA, 2023.

a) Generation of substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction

Construction of the project would occur over a period of approximately 17 months. The multi-use pathway between Marina Avenue and Casa Grande Road would be constructed after that portion of pipeline is installed and would occur at the same time as surface restoration. Pipeline construction activities would proceed at a rate of approximately 100 feet per day.

Project construction would result in temporary increases in ambient noise levels. The City of Petaluma generally restricts construction noise to daytime hours when it is considered to be less than significant (City of Petaluma 2006). The City of Petaluma General Plan identifies Best Management Practices to address construction noise during daytime hours and these measures are identified in **Mitigation Measure NOI-1**.

Construction activities would require the use of heavy construction equipment (e.g., excavator, loader, crane) that would generate varying noise levels, and would consist of passing trucks and other construction-related vehicles. City of Petaluma Noise Ordinance, Section 21.040 (A)(3)(a) considers construction related noise during nighttime hours as a public nuisance and prohibits nighttime construction; however, the Noise Control Officer can provide exemptions, to provisions such as, but not limited to provisions that prohibit construction, demolition, excavation, erection, alteration or repair activity; any tool or piece of equipment powered by an internal-combustion engine; and a hammer or any other device or implement used to repeatedly pound or strike an object (Petaluma, 2022). Maximum Exterior Noise Exposure limits and hours of operation as defined in **Table 3-6**.

Table 3-6: Maximum Exterior Noise Exposure (Leq, dBA)

	Time: 10 p.m. to 7 a.m. M-F	Time: 7 a.m. to 10 p.m. M-F
	10 p.m. to 8 a.m. S, S and Holidays	**8 a.m. to 10 p.m. S, S and Holidays**
General Plan Ambient	60	60
cumulative period of 15 minutes or more in one hour	65	70
cumulative period of 5 minutes or more in one hour	70	75
cumulative period of 1 minute or more in one hour	75	80

SOURCE: Table 21.1, Section 21.040(A)(4) of the City of Petaluma Municipal Code

As indicated in Section 2.5.2 of the Project Description, the City's daytime construction work hours would be adhered to with the exception of microtunneling, which must occur continuously (i.e., 24 hours per day) until the boring is complete. The City's construction noise level limitation of 60 dBA, except where measured ambient levels exceed 60 dBA and would be adjusted in 5 dBA increments, is used here[5] to assess whether nighttime L_{eq} construction-related noise levels would cause a substantial temporary or periodic increase in ambient noise levels at sensitive receptor locations. 60 dBA L_{eq} is used here to assess whether nighttime construction drilling-related noise levels would cause a substantial temporary or periodic increase in ambient noise levels at sensitive receptor locations.

Trenching and Daytime Construction Activities

Daytime construction activities would consist of open cut trenching and include trench excavation, placement of new bedding, installation of the new pipeline, backfill and compaction, and surface restoration, and the installation of the multi-use pathway. Typical noise levels from equipment types that would be used to construct the project are listed in **Table 3-7**.

[5] The ordinance states (City of Petaluma, 2022) that if the measured ambient noise level exceeds 60 dBA, the Maximum Noise Exposure standard shall be adjusted in 5dB increments for each time period as appropriate to encompass or reflect the measured ambient noise level.

Table 3-7: Construction Equipment Noise Levels (50 feet from source)

Type of Equipment	L_{max}, dBA	Hourly L_{eq}, dBA/Usage%
Loader	79	75/40%
Excavator	81	77/40%
Grader	85	81/40%
Dozer	82	78/40%
Tractor	84	80/40%
Backhoes	78	74/40%
Drum Mixer	80	77/50%
Pavers	77	74/50%
Rollers	80	73/20%

NOTES: L_{max} = maximum instantaneous noise level; L_{eq} = the equivalent sound level used to describe noise over a specified period of time, in terms of a single numerical value.
SOURCE: Federal Highway Administration, 2008. *FHWA Roadway Construction Noise Model, Version 1.1*, December 2008.

Operation of each piece of equipment would not be constant throughout the day, as equipment would be turned off when not in use. Over a typical workday, equipment would be operated at different locations; all equipment would not operate concurrently at the same location within the multi-use pathway and alignment.

Construction noise levels have been estimated using typical equipment source noise levels suggested in the Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM) and based on the types of construction equipment that are proposed to be used. To quantify construction-related noise exposure that would occur at the nearest sensitive receptors, it was assumed that the two loudest pieces of construction equipment provided by the City would operate concurrently at the location of the Project sites and alignments closest to the nearest sensitive receptor locations.

The estimated L_{max} and L_{eq} for each of the two loudest pieces of equipment that would be used to construct the project components, and the combined L_{eq} noise level associated with the two loudest pieces of construction equipment at the closest sensitive receptor locations for each project component are identified in **Table 3-7**. The combined L_{eq} construction noise levels would exceed the daytime ambient levels described in **Table 3-8** and would exceed the daytime construction significance threshold. Construction noise at the nearest sensitive receptors would be approximately 78 dBA to 90 dBA, which would exceed measured ambient daytime noise levels by 8 to 26 dBA L_{eq} and would exceed the City's significance threshold, resulting in a significant daytime construction impact. However, the duration of activity near any given receptor would be relatively short. Construction of the pipelines would progress at a rate of approximately 100 feet per day, so maximum noise levels at any one location would be limited to a period of 3 to 5 days. Thus, residential receptors would experience peak noise levels for less than two weeks. With the implementation of **Mitigation Measure NOI-1,** which requires implementation of the City's Best Management Practices to address construction noise during daytime hours, and given the relatively short duration of impact to any given receptor, the project would not 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, and the mitigation measure would reduce the short-term impact to less than significant.

Table 3-8: Daytime Construction Equipment Noise Levels (50 feet from source)

Type of Equipment	Distance to Closest Sensitive Receptor (feet)	Equipment L_{max} at 50 feet, dBA	Equipment Hourly L_{eq} at 50 feet, dBA/Usage %	Combined Leq at Sensitive Receptor, dBA
Open-Cut Trenching, Paving and Restoration				
PIPS to Western Caltrans Right-of-Way/Caltrans Right-of-Way Crossing				
Grader	420 (Caulfield Alley E Residences)	85.0	81.0/40%	65.1
Tractors/Loaders/Backhoes		84.0	80.0/40%	
Marina Apartments to Casa Grande Rd				
Grader	25 (Marina Crossing Residences)	85.0	81.0/40%	89.6
Tractors/Loaders/Backhoes		84.0	80.0/40%	
Casa Grande Rd and Technology Ln				
Grader	30 (Azure Apartment Residences)	85.0	81.0/40%	88.0
Tractors/Loaders/Backhoes		84.0	80.0/40%	
Lakeville Business Park, Corporate Circle, Commercial Properties South of McDowell and Cypress				
Grader	55 (Azure Apartment Residences)	85.0	81.0/40%	82.7
Tractors/Loaders/Backhoes		84.0	80.0/40%	
City Property South of ECWRF				
Grader	50 (River Montessori Charter School)	85.0	81.0/40%	83.6
Tractors/Loaders/Backhoes		84.0	80.0/40%	
Connection at PIPS and ECWRF				
FM Connection at PIPS				
Tractors/Loaders/Backhoes	960 (Guadalupe Street Residences)	84.0	86.0/40%	57.4
Tractors/Loaders/Backhoes		84.0	86.0/40%	
FM Connection at ECWRF				
Tractors/Loaders/Backhoes	1850 (River Montessori Charter School)	84.0	86.0/40%	51.7
Tractors/Loaders/Backhoes		84.0	86.0/40%	

NOTES: L_{max} = maximum instantaneous noise level; L_{eq} = the equivalent sound level used to describe noise over a specified period of time, in terms of a single numerical value.

SOURCE: Federal Highway Administration, 2008. *FHWA Roadway Construction Noise Model, Version 1.1*, December 2008.

In addition to on-site construction equipment, the project would also result in short-term increases in local daytime traffic volumes. The project components would each add up to approximately 60 one-way daily construction-related vehicle trips to area roadways for open-cut trenching, and 25 heavy truck trips to import material and export debris from the project sites. The associated increase in short-term construction vehicular noise levels would not be expected to increase noise levels in the vicinity of existing sensitive receptors beyond the levels described in **Table 3-5**.

Micro-tunneling and Nighttime Work

Operation of construction equipment required to conduct microtunneling of the parallel force main component of the project would occur continuously, until the borehole is complete. As such, for some segments of the project, microtunneling would occur at night. Typical noise levels from equipment types that would be used during microtunneling are listed in **Table 3-9**.

Table 3-9: Construction Equipment Noise Levels (50 feet from source)

Type of Equipment	L_{max}, dBA	Hourly L_{eq}, dBA/Usage%
Loader	79	75/40%
Crane	81	73/16%
Grader	85	81/40%
Flat Bed Truck	74	70/40%
Tractor	84	80/40%
Backhoes	78	74/40%
Drill Rig Truck	79	72/20%
Compressor (Air)	78	74/50%
Generator Set	81	78/50%
Crushing / Proc. Equipment	79	80/20%
Pumps	81	78/50%

NOTES: L_{max} = maximum instantaneous noise level; L_{eq} = the equivalent sound level used to describe noise over a specified period of time, in terms of a single numerical value.

SOURCE: Federal Highway Administration, 2008. *FHWA Roadway Construction Noise Model, Version 1.1*, December 2008. Concrete crusher processing noise level based on data from H.M. Pitt Labs, 2006.

Microtunneling for the crossing of Adobe Creek and the crossing of the storm drains west of the ECWRF would require 24-hour construction while the MTBM is actively tunneling. Microtunneling for the shorter crossing of McDowell Creek and the SMART railroad can be accomplished using daytime construction shifts between 7 a.m. and 10 p.m. Microtunneling activities would begin with construction of launching and receiving shafts and installation of tunneling equipment, which would take approximately six weeks. Shafts would be shored with interlocking sheet piles that would likely require use of a vibratory pile driver. The closest residence (Marina Crossing Apartments) to the receiving microtunneling shaft at McDowell Creek would be exposed to a noise level of approximately 89 dBA, which would be well over the measured ambient daytime noise levels by 24 dBA L_{eq} and would exceed the City's significance threshold of 65 dBA, resulting in a significant daytime construction impact. The closest residence (Azure Apartments) to the receiving microtunneling shafts at Adobe Creek would be exposed to a noise level of approximately 89 dBA, which would be over the measured ambient daytime noise level of levels by 19 dBA L_{eq} and would exceed the City's significance threshold of 70 dBA, resulting in a significant daytime construction impact. The River Montessori Charter School would also be exposed to a noise level of approximately 90 dBA, from the receiving microtunneling shafts at the crossing of the storm drains west of the ECWRF, which would be over the measured ambient daytime noise level by 35 dBA L_{eq} and would exceed the City's significance threshold of 60 dBA, resulting in a significant daytime construction impact. Once the shafts are in place, microtunneling of the steel casing would last up to approximately 40 days at some locations, which would be followed by approximately eight days of installing the force main carrier pipe. After the force main is installed, it would be tested before the tunneling equipment would be removed and the launching and receiving shafts backfilled and resurfaced.

The estimated L_{max} and L_{eq} for each of the two loudest pieces of equipment that would be used during microtunneling, and the combined L_{eq} noise level at the closest sensitive receptor locations for each microtunneling segment are identified in **Table 3-10**. The combined L_{eq} construction noise levels would exceed the daytime ambient levels described in **Table 3-5** at River Montessori Charter School Marina Crossing and Azure Apartments, and would exceed the daytime construction significance threshold of 60 dBA, 65 dBA and 70 dBA, respectively[6].

Rock crushing can produce noise levels of 79 dBA at 50 feet and would only occur during the daytime. **Mitigation Measure NOI-2** is identified to restrict rock crushing activities within 500 feet of sensitive receptors to daytime hours.

As described above, microtunneling would be required to occur 24 hours per day for up to 10 to 48 days at Adobe Creek and the crossing of the storm drains west of the ECWRF. The closest residence (Azure Apartments) to microtunneling at Adobe Creek would be exposed to a noise level of approximately 74 dBA, which would be over the ambient nighttime noise level of 60 dBA in the area and would likely be perceived by nearby residents as a nuisance.

The nighttime drilling noise would exceed the 60 dBA nighttime significance threshold for nearby residences and result in a significant nighttime noise impact. Implementation of **Mitigation Measure NOI-2** would require additional noise controls beyond those required of **Mitigation Measure NOI-1**, including the installation of engineered sound walls. Implementation of **Mitigation Measure NOI-2** would reduce the nighttime noise level by an additional 5 dBA beyond the 2 dBA reduction associated with implementation of **Mitigation Measure NOI-1**.

[6] The ordinance states that if the measured ambient noise level exceeds 60 dBA, the Maximum Noise Exposure standard shall be adjusted in 5dB increments for each time period as appropriate to encompass or reflect the measured ambient noise level.

Table 3-10: Microtunneling and Nighttime Construction Equipment Noise Levels

Type of Equipment	Distance to Closest Sensitive Receptor (feet)	Equipment L_{max} at 50 feet, dBA	Equipment Hourly L_{eq} at 50 feet, dBA/Usage%	Combined L_{eq} at Sensitive Receptor, dBA
Microtunneling Shaft installation (daytime activity per Mitigation Measure NOI-2)				
Receiving Shaft across McDowell Creek (SCWA)				
Tractors/Loaders/Backhoes	85 (Marina Crossing Residences)	84.0	80.0/40%	89.4
Vibratory Pile Driver		95.0	93.8/20%	
Receiving Shaft across Adobe Creek				
Tractors/Loaders/Backhoes	90 (Azure Apartment Residences)	84.0	80.0/40%	88.9
Vibratory Pile Driver		95.0	93.8/20%	
Receiving Shaft across Storm Drains				
Tractors/Loaders/Backhoes	70 (River Montessori Charter School)	84.0	80.0/40%	91.1
Vibratory Pile Driver		95.0	93.8/20%	
Microtunneling (nighttime activity)				
Microtunnel Installation across Adobe Creek				
Drill Rig	90 (Azure Apartment Residences)	79.1	72.2/20%	73.6
Generator		80.6	77.6/50%	
Microtunnel Installation across Storm Drains				
Drill Rig	70 (River Montessori Charter School)	79.1	72.2/20%	75.8[a]
Generator		80.6	77.6/50%	

NOTES: L_{max} = maximum instantaneous noise level; L_{eq} = the equivalent sound level used to describe noise over a specified period of time, in terms of a single numerical value.

Aa The Montessori School is not a nighttime receptor.

SOURCE: Federal Highway Administration, 2008. *FHWA Roadway Construction Noise Model, Version 1.1*, December 2008.

The City of Petaluma prohibits nighttime noise between 10:00 p.m. to 7:00 a.m. on weekdays and between 10:00 p.m. to 9:00 a.m. on weekends/holidays; however, Section 21.040 (a)(5)(e) of the Petaluma Municipal Code exempts "uses established through the discretionary review process containing specific noise conditions of approval and/or mitigation measures" (City of Petaluma 2022b). This exemption would apply to the proposed project's construction activities and would reduce the temporary noise nuisance-related impact on ambient noise levels in excess of established standards to a less-than-significant level.

Operation

Regular operation & maintenance activities would consist of the inspection and repair, as necessary, of pipeline and maintenance access structures. These activities would only be required on an intermittent basis and would result in a minor increase in noise levels. Therefore, this operational impact would be less than significant.

Mitigation Measures

The following mitigation measure shall be incorporated into both the PIPS Parallel Force Main and the Multi-Use Pathway components of the project to reduce potential construction noise impacts. The proposed project's noise impacts would be less than significant with mitigation incorporated.

Mitigation Measure NOI-1 Daytime Construction. The City shall implement noise controls for daytime construction activities that include a minimum of the following measures:

- Two weeks prior to the commencement of construction, a notice to all residences within 300 feet of construction disclosing construction schedule, including the various types of activities that would be occurring throughout the duration of the construction period.
- Require construction equipment and trucks used for project construction to utilize the best available noise control techniques (including mufflers, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds).
- Noise-generating construction activity (other than microtunneling) shall be limited to daytime hours between 7 a.m. to 6 p.m. on weekdays, and 9 a.m. to 5 p.m. on weekends and holidays.
- High noise activities for construction shall be scheduled between 8:00 a.m. and 5:00 p.m (except microtunneling).
- When construction takes place within 100 feet of sensitive receptors, use specific techniques such as, but not limited to, restrictions on construction timing, use of sound blankets on construction equipment, and the use of temporary walls and noise barriers to block and deflect noise.
- Locate stationary equipment, construction staging areas, and construction material areas as far from sensitive receptors as possible.

The following mitigation measure shall be incorporated into the PIPS Parallel Force Main component of the project to reduce potential construction noise impacts. The proposed project's noise impacts would be less than significant with mitigation incorporated.

Mitigation Measure NOI-2 Nighttime Construction. In addition to the measures described in Mitigation Measure NOI-1, the following measures shall be implemented during nighttime construction activities at the Microtunnel Installations across Adobe Creek and the storm drains west of the ECWRF:

- At least two weeks prior to the commencement of nighttime construction activities, a notice to all residences within 300 feet of construction shall be provided disclosing the construction schedule, duration, and providing directions on protocol to follow for noise complaints.

- The City shall install acoustical barriers shielding the drilling equipment from noise sensitive uses at the launch and/or receiving shafts. Barriers shall be located as close to equipment as practicable. The walls shall consist of 8-foot tall sound panels, installed with sound curtains on the noise source side of the wall (batt insulation sewn between vinyl laminates with a weight of 1 pound per square feet).
- Sheet pile installation for launch and receiving pits shall be conducted during daytime hours or adhere to the City conditions of approval and/ or mitigation measures for allowing exemptions (City of Petaluma Municipal Code Section 21.040 (a)(5)(e)).
- Rock crushing of tunneling debris within 500 feet of sensitive receptors shall only be conducted during daytime hours.

Significance Determination

Less than significant with mitigation incorporated.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Vibration can be interpreted as energy transmitted as waves through the ground. These energy waves generally dissipate with distance from the vibration source. Vibration attenuates rapidly with distance because energy is lost during the transfer of energy from one particle to another. Operations and maintenance of the project would not include any sources of vibration that would be considered excessive. Groundborne vibration and noise associated with some construction activities, including the use of pile drivers, blasting, and vibratory rollers can cause excessive vibration. Project construction would not include any such activities. The highest vibration levels for microtunnel Installation would be generated by pile driving activities at McDowell Creek. The closest potential pile driving activity would be approximately 85 feet from the Marina Crossing Apartments. At 85 feet, vibration from pile driving would be reduced to approximately 0.17 inches per second PPV. This level of vibration would be below FTA's 0.5 inches per second PPV criterion for building damage to modern construction (FTA 2018). No pile driving activity is to occur during the nighttime.

The nearest residential buildings along Baywood Drive, Casa Grande Road, and Technology Lane would be located approximately 25 feet from the pipeline alignment. The highest vibration levels would be generated by vibratory compaction equipment. At a distance of 25 feet, vibration from operation of vibratory compaction equipment would be reduced to approximately 0.21 inches per second PPV. This level of vibration would be below FTA's 0.5 inches/second PPV criterion for building damage to modern construction (FTA 2018). Caisson drilling generates vibration levels of up to 0.089 inches per second PPV at 25 feet, which is less than vibratory compaction equipment.

The nearest historical structure is the Masciorini Ranch as discussed in Section 3.5 Cultural Resources. However, the project alignment would be located approximately 0.3-mile southwest of the existing ranch house, which would be a sufficient distance to attenuate construction-related vibration to background levels. Therefore, no existing historic structures that would be potentially vulnerable to vibration are in the immediate vicinity of the project alignment such that any damage related to groundborne vibration from construction activities would occur. This impact would be less than significant and mitigation measures are not warranted.

Mitigation Measures

None required.

Significance Determination

Less than significant.

c) For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?

The project is located approximately 1.5 miles south of the Petaluma Municipal Airport and is not located within the 55 dBA CNEL noise contours for the Petaluma Municipal Airport (City of Petaluma, 2008). The Project would not involve the development of noise-sensitive land uses that would be exposed to excessive aircraft noise. Workers that would construct the project may be exposed to periodic short-term aircraft overflight noise associated with this airport; however, the average construction activity noise levels would be far greater than the average overflight noise levels to which workers would be exposed. Therefore, there would be no impact.

Mitigation Measures

None required.

Significance Determination

No impact.

3.14 Population and Housing

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

Discussion

According to the United States Census Bureau, as of July 2022, the City of Petaluma has a population of 58,652 and 22,756 households. The City of Petaluma 2023-2031 General Plan Update Housing Element (City of Petaluma 2023), citing the Association of Bay Area Governments growth projections, estimated that the City population would increase by 11 percent through 2040, from the 2020 level of 61,873, and that there are currently a total of 22,655 households in the City of Petaluma. The 2020 Urban Water Master Plan projected an estimated population of 69,980 in 2040 based on the 2018 Association of Bay Area Governments population and employment projections (City of Petaluma 2021).

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The proposed project would not directly induce unplanned population growth because no new housing or permanent employment are proposed or would result from construction and operation of the project. The proposed project involves construction of a new force main that would follow the existing force main alignment, resulting in redundancy in sewer service. The proposed project also includes construction and operation of a multi-use pedestrian and bicycle pathway between Marina Avenue and Casa Grande Road. Operation of the project would serve existing and projected wastewater demand, and the multi-use pedestrian and bicycle pathway would serve current and projected population. Both project components are consistent with planned growth that would occur with or without the project. No additional operation and maintenance activities would be needed and no new staff would be required to serve the project. Therefore, the proposed project would not directly or indirectly induce unplanned population growth. No impact would occur.

Mitigation Measures

None required.

Significance Determination

No impact.

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

Construction and operation of the new force main and the multi-use pedestrian and bicycle pathway would occur within existing dirt pathways, parking lots, vacant land, commercial and industrial developments, and within an easement through Caltrans right-of-way. The proposed project would be constructed parallel to the existing force main, but would diverge from the existing force main alignment in one location to avoid constructing across apartments. The project would not displace existing people or houses or require construction of replacement housing. No impact would occur.

Mitigation Measures

None required.

Significance Determination

No impact.

3.15 Public Services

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

Discussion

Fire Protection

The City of Petaluma Fire Department provides fire, rescue, and emergency medical services within the proposed project site. The project site is in the vicinity of Station #1, located at 198 E D St, and Station #3, located at 831 S McDowell Blvd. Station #1 is approximately 2 miles away from the project site, and Station #3 is approximately 1 mile away from the project site. The main headquarters is located at 198 E D Street. The City of Petaluma Fire Department is also the main contact and conduit for disaster preparedness information for all departments, schools, and residents. In 2006, the average response time was less than five minutes (City of Petaluma 2008).

Police Protection

The Petaluma Police Department provides police services within the proposed project side. The main police station is located at 969 Petaluma Boulevard, approximately 3 miles from the project area. The Department has a recommended emergency response time of three minutes (City of Petaluma 2008).

Schools

The City of Petaluma is served by four elementary school districts: Cinnabar School District, Old Adobe Union School District, Petaluma City Unified School District, Waugh School District; and by the Petaluma Joint Union High School District (City of Petaluma 2008). The Petaluma Joint Union High School District and the Petaluma City Unified School District operate under one umbrella agency called Petaluma City Schools, which manages eight elementary schools, two junior high schools, one community day school, and six high schools (City of Petaluma 2008). River Montessori Charter School, located at 3880 Cypress Drive, is the closest school, located approximately 50 feet from the project site. The City of Petaluma General Plan 2025 projected that the Sonoma County elementary school enrollment would decline slightly by 2025, using 85 percent of the 2005 capacity of elementary schools, and secondary school enrollment would decline 15 percent by 2025, using less than 98 percent of the 2005 capacity of secondary schools.

Parks

The City of Petaluma Parks and Recreation Department maintains and manages approximately 56 parks, open spaces, and recreation facilities (City of Petaluma nd). There are three parks adjacent to the project site. Rocky Dog Memorial Park, located at 2204 Casa Grande Road, Shollenberger Park and Open Space, located at 1400 Cade Lane, and Southgate Park, located at 1743 Southgate Drive are within or adjacent to the projects site. The City of Petaluma General Plan 2025 states that the City has adopted a citywide parks standard of 5 acres of parkland per 1,000 residents and as of October 2005, the City was providing 5.1 acres of parkland per 1,000 residents (City of Petaluma 2008).

Libraries

There is one public library accessible to the City's residents: the Petaluma Regional Library, located at 100 Fairgrounds Drive, approximately two miles from the proposed project site. The Petaluma Regional Library also includes the Petaluma History Room where residents can access historical records about the City and surrounding areas (Sonoma County Library nd).

Hospitals

There are three hospitals located in the City of Petaluma: the Petaluma Valley Hospital (located at 400 North McDowell Boulevard), approximately 2.5 miles from the project site, the Petaluma Valley Medical Center (located at 104-108 Lynch Creek Water), approximately 2.2 miles from the project site, and Petaluma Health Center (located at 1179 North McDowell Avenue), approximately 4 miles from the project site.

a.i-ii) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services: Fire protection or police protection?

The proposed project would not construct new facilities or physically alter existing fire, police protection facilities, nor would it substantially change response times or service ratios for fire, police protection services and facilities. Fire protection requirements during construction of the proposed project would be short-term and the demands would be fulfilled by the existing local work force. Existing protection services provided by the City of Petaluma fire department and police department would be sufficient. In addition, construction and operation of the project would not directly or indirectly induce unplanned population growth that would require construction of new fire or police stations or expansion of fire or police protection facilities. Therefore, no impact would occur.

a.iii-v) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services: Schools, parks, or other facilities?

The proposed project would not change existing demand on schools, parks, or other facilities such as libraries and hospitals because the project would service existing and planned communities. Construction of the proposed project does not include housing and operation would not result in new employment or population growth that would result in an influx of people or students. No new school facilities would need to be built to maintain class size ratios or other school performance objectives. No new parks or recreation facilities would need to be built to maintain the City's park acreage standard. Construction and operation of the project would not necessitate expansion of existing or construction of new public facilities such as libraries or hospitals. As a result, no impact on school capacity, park service ratios, or capacity of libraries, hospitals or other public facilities would occur.

Mitigation Measures

None required.

Significance Determination

Less than significant with mitigation incorporated.

3.16 Recreation

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

<u>*Discussion*</u>

The City of Petaluma offers recreation opportunities throughout the city, with approximately 18 percent of its land (1,300 acres) devoted to parks and open space (City of Petaluma 2008). Existing parks and recreational facilities near the project site include Rocky Memorial Dog Park, located at 1200 Casa Grande Road, and Shollenberger Park, located at 1400 Cader Lane, both of which are managed by the City. Existing trails near the project site include a recreational trail near Rocky Memorial Dog Park and a Class I off street bicycle trail near Shollenberger Park (City of Petaluma 2008).

General Plan Policy 6-P-1 and programs set forth therein provide guidance to retain and expand recreational resources for the health and welfare of the City's inhabitants. As set forth in the General Plan, the City has adopted a citywide parks standard of 5 acres of parkland per 1,000 residents, or approximately 0.005 of park space per resident (City of Petaluma 2008).

The City developed the Bicycle and Pedestrian Plan as an appendix to the General Plan 2025 and evaluated potential transportation impacts of the General Plan for the purpose of creating and maintaining a safe, comprehensive, and integrated bicycle and pedestrian system throughout the City. The City's pedestrian network consists of sidewalks, trails, and street crossings. Central Petaluma and the West Side have an extensive sidewalk network and pleasant walking conditions, but newer sections of the City, particularly in the Eastside, are characterized by discontinuous sidewalk networks (City of Petaluma 2006; City of Petaluma 2008). The City's existing multi-use trails provide alternative transportation to pedestrians and bicyclists throughout the City. The most popular trail is at Shollenberger Park with connections to the Alman Marsh Trail and emerging Adobe Creek Trail, which is the closest trail to the project site. The City's existing bicycle network consists of Class 1 bicycle paths along portions of several creeks and short sections along the Petaluma River, Class II bicycle lanes on portions of several streets, and Class III bicycle routes along several segments (City of Petaluma 2006). There are currently 19 miles of Class I, 20.3 miles of Class II, and one mile of Class III bicycle pathways in the City (City of Petaluma 2008).

a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

PIPS Parallel Force Main

The new sewer force main would serve existing and planned communities. The new sewer force main does not include residential housing and would not induce permanent employment or population growth that would increase the use of existing parks and recreational facilities. Although construction of the new sewer force main may require temporary closures of roadways, bicycle lanes, and sidewalks, potential impacts related to these closures would be minimized through the implementation of a Traffic Control Plan, as described in **Mitigation Measure TRA-1.** Implementation would ensure potential temporary impacts related to closures of pedestrian and bicycle access routes are less than significant. In addition, bicycle lanes and sidewalks that would be temporarily impacted would be restored upon the completion of construction. The new sewer force main would not increase the use of existing or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated. Therefore, the new sewer force main would have no impact.

Multi-Use Pathway

The proposed multi-use pathway would serve existing and projected population. The pathway would be adjacent to Rocky Memorial Dog Park, located at 1200 Casa Grande Road, and in proximity to Shollenberger Park, located at 1400 Cader Lane. The multi-use pathway could result in an incremental increase in the use of nearby parks as well as designated open space areas. However, the multi-use pathway's contribution to increased park use would not result in substantial physical deterioration of facilities nor would deterioration be accelerated. The proposed multi-use pathway is a planned component of the City of Petaluma Bicycle and Pedestrian Plan and is intended to provide connectivity and increased use of nearby, existing multi-use pathways. Therefore, impacts related to the physical deterioration of parks and other recreational areas would be less than significant.

Mitigation Measures

See **Mitigation Measure TRA 1: Traffic Control and Detour Plan** described below**.**

Significance Determination

Less than significant with mitigation.

b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

PIPS Parallel Force Main

The new sewer force would not require construction or expansion of recreational facilities which could have an adverse physical impact on the environment. As a result, no impact would occur.

Multi-Use Pathway

The project includes construction of a 2,100-foot-long Class 1 off-street multi-use bicycle pathway between Marina Avenue and Casa Grande Road. It is assumed the multi-use pathway would consist of a 12-foot-wide path, paved with asphalt, with 3-feet shoulders on either side. Because the multi-use pathway would not induce population growth and would serve the population growth anticipated in the General Plan, it would not require the construction or expansion of other recreational facilities that might have an adverse physical effect on the environment. Any physical impacts related to the construction of new recreational facilities, such as new parks and multi-use pathways were evaluated in appropriate sections of the General Plan DEIR. The General Plan DEIR determined that new facilities could impact air and traffic noise levels through construction activities, degrade water quality through sedimentation, and increase drainage flows as a result from added impervious surfaces (City of Petaluma 2006). The General Plan DEIR assessed that the integration of the General Plan policies and mitigation measures mentioned in the DEIR would mitigate these impacts to a less than significant level. Therefore, impacts are expected to be less than significant as a result of the proposed project.

Mitigation Measures

None required.

Significance Determination

Less than significant impact.

3.17 Transportation

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
Would the Project:				
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	[ ]	[ ]	[X]	[ ]
b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	[ ]	[ ]	[X]	[ ]

c)	Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	[ ]	[X]	[ ]	[ ]
d)	Result in inadequate emergency access?	[ ]	[X]	[ ]	[ ]

<u>*Discussion*</u>

Environmental Setting

Major roadways in the project area are shown in **Figure 2.3-2**. The project area is accessed from U.S. Highway 101 via the interchange at State Route 116 (SR 116), also known as Lakeville Highway, which becomes Lakeville Street west of U.S. 101. The west end of the project site is accessed from Hopper Street (via Lakeville Street and East D Street), where the existing PIPS force main is located. U.S. 101 has an overhead viaduct passing perpendicularly over the proposed PIPS parallel force main alignment. East of U.S. 101, access to the proposed alignment from SR 116 is available from Marina Avenue and Casa Grande Road, both of which extend south from SR 116, and from Technology Lane, which extends east from Casa Grande Road.

According to the Sonoma County Bicycle and Pedestrian Plan as well as the City of Petaluma Bicycle and Pedestrian Plan, the nearest designated bikeways in the vicinity of the project site are Class I facilities located along the Petaluma River Trail and Adobe Creek, to the west and east of the proposed multi-use pedestrian and bicycle pathway between Marina Avenue and Casa Grande Road (Sonoma County 2010). Additionally, there is an existing Class II facility extending from Casa Grande Road to Technology Lane.

Hopper Street currently provides access for routine monitoring and inspection of the existing PIPS and PIPS force main alignment and would continue to be used after the proposed project is implemented.

Regulatory Setting

<u>California Department of Transportation</u>

The California Department of Transportation (Caltrans) has jurisdiction over state highways and sets maximum load limits for trucks and safety requirements for oversized vehicles that operate on highways. Sonoma County is under the jurisdiction of Caltrans District 4. The following Caltrans regulations apply to potential transportation and traffic impacts of the project:

> **California Vehicle Code, Division 15, Chapters 1 through 5 (Size, Weight, and Load).** Includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways.
>
> **California Streets and Highways Code, Sections 660-711 and 670-695.** Requires permits from Caltrans for any roadway encroachment during truck transportation and delivery, includes regulations for the care and protection of state and county highways and provisions for the issuance of written permits, and requires permits for any load that exceeds Caltrans weight, length, or width standards for public roadways.

Caltrans Highway Design Manual, Chapter 1000 – Bicycle Transportation Design, Section 1003.1 Class I Bikeways (Bike Paths). The proposed multi-use pedestrian and bicycle pathway would be designed in accordance with the Bikeway Design Criteria outlined for Class I Bikeways under Topic 1003.

Sonoma County Comprehensive Transportation Plan

The Sonoma County Comprehensive Transportation Plan (CTP) examines the current state of transportation in the county, looks at future needs and goals, and provides information on how these needs and goals can be met. The CTP is updated frequently enough to ensure that the plan is still relevant and useful and represents the current transportation needs and goals of the SCTA and Sonoma County jurisdictions. The current CTP was updated in September 2021. The Plan outlines proposed transportation projects in the county consistent with the proposed multi-use pathway.

City of Petaluma General Plan

The mobility element of the Petaluma General Plan identifies long range transportation needs for the City of Petaluma (City of Petaluma 2008). The following policies are relevant to the project's transportation analysis.

5-P-5: Consider impacts on overall mobility and travel by multiple travel modes when evaluating transportation impacts.

5-P-15: Implement the bikeway system as outlined in the Bicycle and Pedestrian Plan, and expand and improve the bikeway system wherever the opportunity arises.

5-P-22: Preserve and enhance pedestrian connectivity in existing neighborhoods and require a well connected pedestrian network lining new and existing developments to adjacent land uses.

5-P-25: Establish a network of multi-use trails to facilitate safe and direct off-street bicycle and pedestrian travel. At the minimum, Class I standards shall be applied unless otherwise specified.

City of Petaluma Bicycle and Pedestrian Plan

The Petaluma Bicycle and Pedestrian Plan was prepared by the City's Pedestrian and Bicycle Advisory Committee (PBAC) in 2008 in order to promote the creation, expansion, and maintenance of a safe, comprehensive, and integrated bicycle and pedestrian system for recreational users and commuters throughout Petaluma. Near the proposed alignment, top priority bicycle projects include a bikeway along Petaluma Boulevard South as well as Class II bike lanes along Lakeville Highway.

a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

The proposed project would not involve any new or modified land uses that would generate long-term vehicle trips or other features that may affect the local or regional circulation system. The project would create a temporary source of new vehicle trips on Hopper Street, Marina Avenue, Casa Grande Road, Technology Lane, McDowell Boulevard, and Cypress Drive during the construction period, as well as on other roadways providing access to the microtunnel drilling and receiving pits, pipe delivery along the proposed alignment, and other construction activities. Additionally, microtunneling activities would take place along an existing, publicly accessible recreation trail within the City's property. However, these trips would take place for just over a year, and the number of project-related vehicle trips that would occur after construction is anticipated to be the same as the number associated with existing ongoing inspection and maintenance of the existing pipeline. Additionally, the project would include the implementation of a multi-use pedestrian and bicycle pathway between Marina Avenue and Casa Grande Road. This pathway is a planned component of the City of Petaluma Bicycle and Pedestrian Plan and would facilitate the Plan's goal to make Petaluma a pedestrian- and bicycle-friendly community. Therefore, the project would provide beneficial opportunities for nonmotorized travel consistent with applicable plans and policies, and the impact would be less than significant.

Mitigation Measures

None required.

Significance Determination

Less than significant.

b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?

CEQA Guidelines Section 15064.3(b) indicates that vehicle miles traveled is the most appropriate measure for identifying transportation impacts. In December 2018, the Governor's Office of Planning and Research (OPR) provided an updated technical advisory to help evaluate transportation impacts under CEQA. In particular, the technical advisory screening threshold for small projects states that projects generating or attracting fewer than 110 one-way automobile trips per day may generally be assumed to cause a less than significant transportation impact (OPR, 2018).

At any given time during project activities, no more than 60 vehicle trips per day would occur at the project site, which is below the technical advisory's screening threshold for a significant impact. The number of peak trips occurring any one day would be less than the number identified in the technical advisory's guidance. Further, the proposed project would not be associated with additional City operation and maintenance activities beyond what already occurs at the project site. There would be no increase in operational VMT associated with the project. Therefore, the impact would be less than significant.

Mitigation Measures

None required.

Significance Determination

Less than significant.

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

During construction, temporary staging and work areas along project access roads would not include permanent features that would increase roadway hazards due to design or incompatible uses. Construction may include the presence of equipment, materials, or open trenches in public roadways. Although proposed construction activity would affect roadway functioning, such activity would be temporary and would not increase hazards or incompatible uses. Once in operation, the forcemain and path would not include aboveground appurtenances, such as vents and cleaning access within public roadways that would create a permanent hazard. The multi-use pedestrian and bicycle pathway would decrease hazards by increasing connectivity within the project area and providing paved access for nonmotorized travel. Potential construction impacts would be reduced through the implementation of **Mitigation Measure TRA-1: Traffic Control Plan**.

Mitigation Measures

The following mitigation measure shall be incorporated into the project to reduce potential impacts to access and hazards in public roadways during construction. The proposed project's traffic impacts would be less than significant with mitigation incorporated.

> **Mitigation Measure TRA-1: Traffic Control Plan** Before the start of project construction activities, a traffic control plan shall be submitted to the City of Petaluma Traffic Engineering Division for review and approval. The plan shall include measures such as, but not limited to, appropriate signage, traffic cones, temporary trench covers, coordination with local police and emergency service providers, and flaggers to allow for emergency vehicle and property access during project construction. Additionally, the plan will include measures to account for construction hazards such as the presence of equipment and materials in public roadways. The traffic control plan shall also include a public outreach component and shall be developed and implemented in coordination with the Petaluma Communications Team.

Significance Determination

Less than significant with mitigation.

d) Result in inadequate emergency access?

Hopper Street, Marina Avenue, Casa Grande Road, and Technology Lane provide emergency access to existing residential developments and lodgings that are along the project alignment or whose access would be crossed by the project alignment. These roadways would be temporarily utilized during construction for project access and, in some cases, trenched during pipeline construction. Although no roadways would be completely closed during project construction, temporary lane closures would occur and construction-related vehicles and equipment could be present in these roadways and could adversely affect emergency access. This impact would be potentially significant.

Mitigation Measure TRA-1: Traffic Control Plan would be implemented to reduce this impact. This mitigation measure would require that roadway ingress and egress be maintained to facilitate emergency access, by requiring the placement of signage indicating any temporary lane closures and rerouting, as well as the presence of flaggers in both directions to safely direct emergency access through the construction areas. Implementing **Mitigation Measure TRA-1** would reduce the impact to a less-than-significant level.

Mitigation Measure TRA-1 would ensure that any temporary impacts to emergency vehicle flow and/or ingress/egress to properties along the project site are coordinated in advance with emergency service providers and law enforcement to ensure that provision of sufficient emergency service, access, and evacuation routes can occur during construction if necessary. The impact would be less than significant with mitigation.

Mitigation Measures

See **Mitigation Measure TRA-1 Traffic Control Plan**, as described above.

Significance Determination

Less than significant with mitigation.

3.18 Tribal Cultural Resources

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

Discussion

California Health and Safety Code Section 7050.5

California law protects Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. California Health and Safety Code Section 7050.5 requires that if human remains are discovered in any place other than a dedicated cemetery, no further disturbance or excavation of the site or nearby area reasonably suspected to contain human remains shall occur until the county coroner has examined the remains (Section 7050.5[b]). PRC Section 5097.98 also outlines the process to be followed in the event that remains are discovered. If the coroner determines or has reason to believe the remains are those of a Native American, the coroner must contact the Native American Heritage Commission (NAHC) within 24 hours (Section 7050.5[c]). NAHC will notify the "most likely descendant." With the permission of the landowner, the most likely descendant may inspect the site of discovery. The inspection must be completed within 48 hours of notification of the most likely descendant by NAHC. The most likely descendant may recommend means of treating or disposing of, with appropriate dignity, the human remains, and items associated with Native Americans.

California Public Resources Code, Section 5097.98

PRC Section 5097.98 addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, or inadvertent destruction; establishes procedures to be implemented if Native American skeletal remains are discovered during construction of a project; and establishes the NAHC to resolve disputes regarding the disposition of such remains. These requirements have been incorporated into Section 15064.5(e) of the CEQA Guidelines. The proposed project would be required to comply with PRC Section 5097.98 should any unknown human remains be discovered during site disturbance.

Assembly Bill (AB) 52 Consultation

AB 52 established a formal consultation process. AB 52 mandates that the lead agency must provide formal written notification to the designated contact of traditionally and culturally affiliated California Native American tribes that have previously requested notice. Native American tribes are notified early in the project review phase by written notification that includes a brief description of the proposed project, location, and the lead agency's contact information. The Tribal contact then has 30 days to request project-specific consultation pursuant to this section (Public Resources Code §21080.1).

As a part of the consultation pursuant to Public Resources Code §21080.3.1(b), both parties may suggest mitigation measures (Public Resources Code §21082.3) that can avoid or substantially lessen potential significant impacts to TCRs or provide alternatives that would avoid significant impacts to a TCR. The California Native American tribe may request consultation on mitigation measures, alternatives to the project, or significant effects. The consultation may also include discussion on the environmental review, the significance of TCRs, the significance of the project's impact on the TCRs, project alternatives, or the measures planned to preserve or mitigate impacts on resources. Consultation shall end when either: 1) both parties agree on the mitigation measures to avoid or mitigate significant effects on a TCR, or 2) a party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached.

Summary of Consultation

As determined through background research conducted at the Northwest Information Center (NWIC) of the California Historical Resources Information System and a survey, the proposed project would not impact any known archaeological resources that could also be considered tribal cultural resources, listed or determined eligible for listing in the California Register of Historical Resources (California Register), or included in a local register of historical resources as defined in PRC Section 5020.1(k), pursuant to PRC Section 21074(a)(1).

ESA contacted the Native American Heritage Commission (NAHC) on November 7, 2023, to request a search of the NAHC's Sacred Lands File and a list of Native American representatives who may have knowledge of tribal cultural resources in the project site, or interest in the proposed project. The NAHC replied by email on December 11, 2023, with the statement that the Sacred Lands File has no record of sacred sites within the project vicinity. The NAHC's response included a list of 11 Native American representatives from 8 Tribes who may have knowledge of tribal cultural resources in the proposed project site or be interested in the proposed project.

In accordance with PRC Section 21080.3.1(d), the City of Petaluma provided written formal notification to the Federated Indians of Graton Rancheria (FIGR) on September 14, 2023, which included a brief description of the proposed project and its location, the City's contact information, and a notification that FIGR has 30 days to request consultation pursuant to this section. The City received a response requesting consultation under PRC Section 21080.3.1(b)(2) from the FIGR on October 4, 2023. The City entered into consultation with FIGR, coordinated on a routine basis, and provided requested information. FIGR requested that project construction activities be conducted with the presence of a Tribal Monitor.

a.i, a.ii) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

> ***Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k).***
>
> ***A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.***

Tribal cultural resources are: (1) sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are listed, or determined to be eligible for listing, in the California Register, or local register of historical resources, as defined in PRC Section 5020.1(k); or (2) a resource determined by the CEQA lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC Section 5024.1(c). For a cultural landscape to be considered a tribal cultural resource, it must be geographically defined in terms of the size and scope of the landscape (PRC Section 21074[b]). A historical resource as defined in PRC Section 21084.1, a unique archaeological resource as defined in PRC Section 21083.2(g), or a non-unique archaeological resource as defined in PRC Section 21083.2(h) may also be a tribal cultural resource.

Based on the results of the tribal consultation efforts, tribal cultural resources listed or determined eligible for listing in the California Register or included in a local register of historical resources as defined in PRC Section 5020.1(k), pursuant to PRC Section 21074(a)(1), are not expected to be affected by the proposed project with implementation of mitigation measures.

If any previously unrecorded archaeological resource were identified during ground-disturbing construction activities and were found to qualify as a tribal cultural resource pursuant to PRC Section 21074(a)(1) (determined to be eligible for listing in the California Register or in a local register of historical resources), any impacts of the proposed project on the resource could be potentially significant. Any such potentially significant impacts would be reduced to a less-than-significant level by implementing **Mitigation Measure CUL-1: Cultural Resources Awareness Training**, **Mitigation Measure CUL-2: Inadvertent Discovery of Cultural Resources**, and **Mitigation Measure CUL-3: Inadvertent Discovery of Human Remains** (see Section 3.5, *Cultural Resources*). These mitigation measures require that all construction personnel involved in ground disturbance receive a training on the identification of cultural resources and that work halt in the vicinity of a find until a qualified archaeologist can make an assessment and provide additional recommendations if necessary, including contacting Native American tribes (refer to Section 2.5, *Cultural Resources*).

As a result of the City's consultation with Federated Indians of Graton Rancheria, **Mitigation Measure TCR-1: Tribal Monitoring** would address the Tribe's concerns regarding potential impacts by requiring a tribal monitor be present during ground-disturbing activities.

Mitigation Measures:

The following mitigation measure shall be incorporated into the project to reduce potential impacts to unknown tribal cultural resources that could be uncovered during trenching and excavation. The proposed project's potential tribal cultural resources impacts would be less than significant with mitigation incorporated.

> **Mitigation Measure TCR-1: Tribal Monitoring.** Prior to issuance of a grading permit, the City shall retain the services of a Tribal Monitor by entering into a Tribal Monitoring Agreement with the Federated Indians of Graton Rancheria, to monitor initial ground disturbing activities for the inadvertent discovery of archaeological resources (prehistoric and historic-era). Prior to ground disturbing activities the FIGR Tribal Monitor shall review the construction schedule and advise the contractor of the activities that require monitoring presence. The contractor shall notify the FIGR Tribal Monitor within 24 hours of the construction work requiring monitoring. The FIGR Tribal Monitor shall be present on site during initial ground disturbance to observe and investigate any potential resources. The FIGR Tribal Monitor shall have the authority to request that construction work halt as needed to investigate potential resources. If a potentially significant archaeological resource is encountered the archaeologist shall be provided sufficient time to evaluate the resource and make treatment recommendations in accordance with CEQA Guidelines §15064.5 and in consultation with FIGR.

Significance Determination:

Less than significant with mitigation incorporated.

3.19 Utilities and Service Systems

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

Discussion

Utilities and Service Systems Settings

The City of Petaluma maintains public utility infrastructure, including water, wastewater, and storm drains.

Water Service

The City of Petaluma has three existing sources of water supply: entitlement from Sonoma Water for potable water, groundwater from the City's potable water wells, and recycled non-potable water from the ECWSRF (City of Petaluma 2021). The City receives approximately 95 percent or more of its potable water supply from Sonoma Water under the provisions of the Restructured Agreement for Water Supply (City of Petaluma 2021). Sonoma Water anticipates meeting the obligation to deliver 13,400 acre-feet per year (AFY) of water out to 2045 (City of Petaluma 2021). The City of Petaluma owns and operates the ECWSRF and offsets approximately 2 to 3 percent of total demand for potable water with recycled water (City of Petaluma 2021).

Wastewater Treatment

The ECWRF treats all wastewater generated by the City of Petaluma and the unincorporated Sonoma County community of Penngrove. The collection system is comprised of approximately 193 miles of gravity sewer mains, four miles of sewer force mains, and nine lift stations (City of Petaluma 2021). The treatment capacity is about 6.7 MGD (average dry weather flow). Approximately 4.6 MGD are treated under the existing wastewater generation conditions, leaving approximately 2.1 MGD in available treatment capacity (City of Petaluma 2021). In the winter, secondary treated wastewater effluent is conveyed to the Petaluma River. During summer, a portion of the effluent receives tertiary treatment and the recycled water is used for irrigation of agricultural lands, golf courses, city parks, schools, and landscaped areas of residential and commercial development (City of Petaluma 2021; n.d.).

Stormwater Drainage

Within the City of Petaluma storm drains convey runoff from impervious surfaces such as streets, sidewalks, and buildings to gutters that drain to creeks and the Petaluma River and ultimately to San Pablo Bay. Most storm water is untreated and carries with it any contaminants picked up along the way such as solvents, oils, fuels, and sediment. The City has implemented a storm drain-labeling program to provide a visual reminder that storm drains are for rainwater only. The City establishes the standard requirements and controls on the storm drain system through its Stormwater Management and Pollution Control Ordinance (City of Petaluma Municipal Code Chapter 15.80). Through the Stormwater Management and Pollution Control Ordinance, the City has the authority to prohibit non-storm water discharges into the municipal separate storm sewer system. Stormwater quality and flooding potential in the proposed project area are described in *Section 3.10 Hydrology and Water Quality*.

Electrical, Natural Gas, and Telecommunications Utilities

Pacific Gas and Electric Company (PG&E) is the local utility distributor that delivers electricity to the City of Petaluma (City of Petaluma 2006). Sonoma Clean Power (SCP) manages the purchasing and sourcing of electricity for Sonoma and Mendocino counties, including the City of Petaluma. The PG&E service area includes approximately 94,000 square miles in Northern and Central California. PG&E's electric distribution system in the City of Petaluma is a 12-kV system that is composed of poles, wires, conduits, substructure, transformers, and other equipment (City of Petaluma 2006).

PG&E is the natural gas provider in the City of Petaluma.

Telecommunications service in the City of Petaluma is provided by AT&T, Xfinity, HughesNet, Viasat, and Verizon.

Landfills

The City of Petaluma contracts with Recology Sonoma Marin for recycling, organics, and solid waste services. Solid waste generated in the City of Petaluma is hauled by Recology and taken to the Redwood Landfill and Recycling Center. The Redwood Landfill and Recycling Center is located at 8950 Redwood Highway in Novato, California and has a remaining capacity of 26,000,000 cubic yards (CalRecycle n.d.).

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

The project includes construction of a parallel force main and a multi-use pathway within the City of Petaluma. The project would not require or result in the construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas or telecommunications facilities beyond the construction of the new parallel force main included in the proposed project to improve operational efficiency and redundancy. Construction of the project would occur within existing dirt pathways, parking lots, vacant, and commercial and industrial developments that would be restored to pre-construction conditions, so no permanent change in stormwater drainage would occur. As discussed in *Section 3.14 Population and Housing,* the proposed project would serve existing and planned communities and would not induce unplanned population or employment growth that would require or result in the construction of new or expanded water, wastewater treatment, stormwater drainage, electrical power, natural gas, or telecommunications facilities. As explained in *Section 3.6 Energy*, operation of the proposed project would involve minimal consumption of electricity. Therefore, the project would not result in the need to construct new electrical facilities. As explained in *Section 3.10 Hydrology and Water Quality*, the existing storm drain infrastructure in the project area would accommodate the slight increase in runoff from the additional impervious surfaces associated with the proposed multi-use path. The environmental impacts of construction and operation of the proposed project's parallel force main and multi-use pathway are evaluated throughout this IS/MND and are anticipated to all be mitigated to a less than significant level.

Mitigation Measures

None required.

Significance Determination

Less than significant.

b) Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?

The project involves creating redundancy to the existing PIPS force main and constructing a multi-use pathway to make Petaluma a pedestrian- and bicycle-friendly community. Construction of the proposed project would require a minimal water supply for purposes such as dust control and concrete mixing. Existing sources would be sufficient and no new or expanded supply would be required for construction.

Operation of the proposed project would not induce unplanned population growth that would require or result in the construction of new water treatment facilities or the expansion of existing facilities. No impact related to sufficient water supplies would occur.

Mitigation Measures

None required.

Significance Determination

No impact.

c) Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?

The proposed project includes construction of a parallel wastewater force main to create redundancy for the existing PIPS force main and construction of a multi-use pathway. As discussed in *Section 3.14 Population and Housing*, the proposed project would serve existing and planned development that would occur with or without the proposed project and the project would not induce unplanned population or employment growth that would require or result in the construction of new or expanded wastewater collection infrastructure or treatment services. Therefore, there would be no impact.

Mitigation Measures

None required.

Significance Determination

No impact.

d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Construction of the proposed project would generate solid waste in the form of construction and demolition debris that would need to be hauled off site and disposed of in a landfill by the construction contractor(s). Construction and demolition material would include asphalt and concrete removed from paved areas and concrete, metal, and plastic pipe sections. It is estimated that approximately 52,000 cubic yards would need to be excavated and removed for construction of the parallel force main and 2,800 cubic yards of material would need to be hauled on site as the new fill for the multi-use pathway. All excavated material would be exported and disposed of at a permitted landfill in accordance with local and state solid waste disposal requirements. There are two state regulations that set standards for solid waste generation: AB 939 mandates 50 percent diversion of solid waste; and AB 341 mandates recycling programs to help reduce GHG emissions. Waste material may be hauled to the Redwood Landfill and Recycling Center, approximately 8 miles from the project site. The Redwood Landfill and Recycling Center has a remaining capacity of 26,000,000 cubic yards (CalRecycle n.d.). Therefore, the existing landfill would have sufficient capacity to accommodate construction debris from the proposed project.

Operation of the project is not anticipated to generate solid waste in the long-term. Therefore, solid waste generation would be limited to temporary construction activities and would not significantly affect available solid waste disposal capacity in the region. Therefore, impacts related to local infrastructure capacity would be less than significant.

Mitigation Measures

None required.

Significance Determination

Less than significant.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Construction and operation of the proposed project would comply with local, state, and federal regulations related to solid waste. While operation of the project is not anticipated to generate a long-term solid waste stream, construction activities would create debris such as excavated soil and demolished concrete, asphalt, metal, and plastic. Construction contractor(s) would be required to dispose of excess construction debris in accordance with existing reduction statutes (AB 939 and AB 341) and regulations, including 2022 CALGreen Code 4.408.1. These regulations would determine the landfill to be used for disposal of construction debris, mandate 65 percent diversion of solid waste (CALGreen Code 4.408.1), and mandate recycling programs to reduce GHG emissions (AB 341). Therefore, impacts related to compliance with local, state, and federal reduction statutes and regulations related to solid waste would be less than significant.

Mitigation Measures

None required.

Significance Determination

Less than significant.

3.20 Wildfire

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	[ ]	[X]	[ ]	[ ]

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	[ ]	[X]	[ ]	[ ]
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	[ ]	[ ]	[ ]	[X]
d) Expose people or structures to significant risks, including downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	[ ]	[ ]	[ ]	[X]

Discussion

The City of Petaluma has an Emergency Operations Plan, which provides the necessary foundation for emergency management activities before, during, and after an emergency or disaster and provides essential guidance for disaster-related actions (City of Petaluma 2022). Additionally, the City also has a Local Hazard Mitigation Plan, which guides planning efforts to better protect residents from the impacts of hazardous events (City of Petaluma 2020).

The City of Petaluma is susceptible to wildland fires due to the steep topography, abundant fuel load, and climatic conditions, particularly along the edges of the city. Areas most susceptible to fire hazards are located near the wildland urban interface at the City margins. Lands surrounding the City of Petaluma that are within the State Responsibility Area are classified as moderate fire hazard severity zone to the west and south of the City and high and moderate to the east and north. The hills and grasslands within the southern City limits, in the vicinity of the proposed project, are classified as moderate hazard severity rating, as part of the City's local responsibility areas (City of Petaluma 2020).

The California Department of Forestry and Fire Protection's (CAL FIRE) Fire and Resource Assessment Program (FRAP) assess the amount and extent of California's forest and rangelands, analyzes their conditions, and identifies alternative management and policy guidelines. Through the FRAP, CAL FIRE produces maps designating very high fire hazard severity zones (VHFHSZ) within state responsibility areas (SRAs) and local responsibility areas (LRAs). The proposed project site area is designated as a non-VHFHSZ in the City of Petaluma LRA (CAL FIRE 2007).

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

The project site is not located in a CAL FIRE nor City of Petaluma Fire Prevention Bureau designated VHFHZ. Construction activities would be located within existing dirt pathways, parking lots, vacant land, and commercial and industrial developments. Sidewalk and lane closures during construction would temporarily restrict access for use by emergency response vehicles or emergency evacuations and could impair implementation of or physically interfere with the City of Petaluma Emergency Operations Plan or Local Hazard Mitigation Plan. Prior to construction activities, the City would develop a Traffic Control Plan (see **Mitigation Measure TRA-1**) to reduce impacts to emergency vehicle access potentially caused by lane closures that would take place during construction of the proposed project. Further consideration of the proposed construction activities and potential for roadway access and hazardous conditions can be found under *Section 3.17 Transportation*.

Operation of the proposed project would not physically impair or otherwise interfere with adopted emergency response or evacuation plans in the project area, as all disturbed ground surface would be returned to pre-construction conditions after excavation and below-grade pipeline installation. Project operation would involve minimal truck trips for maintenance as needed, and would not have an impact on an adopted emergency response plan or emergency evacuation plan. Impacts would be less than significant.

Mitigation Measures

None required.

Significance Determination

Less than significant with mitigation incorporated.

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

The project and surrounding area are not located within very high or high fire hazard severity zones; however, the eastern portion of the project area is within a moderate fire hazard severity zone within the City LRA (CAL FIRE 2007; City of Petaluma 2020). The project would be constructed on dirt pathways, parking lots, vacant land, and commercial and industrial developments that do not have steep slopes. Pipelines would be installed below grade on parcels that do not have steep slopes, and the multi-use pathway would be constructed on a flat surface. Therefore, the operation of the proposed project would not exacerbate wildfire risks. However, because the project would involve the use of construction equipment that could pose a fire risk in grassland areas designated as a moderate fire hazard severity zone, the City would require its construction contractor to implement **Mitigation Measure FIR-1**. **Mitigation Measure FIR-1** requires fire prevention and protection measures during construction. Therefore, the project would not exacerbate wildfire risks. Impacts would be less than significant with mitigation.

Mitigation Measures

The following mitigation measures shall be incorporated into the project to reduce impacts associated with fire hazards during construction. The proposed project's impacts related to wildfire risk, and the exposure of project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire would be less than significant with mitigation incorporated.

Mitigation Measure FIR-1: Fire Prevention and Protection Practices. The City shall be responsible for ensuring its construction contractor maintains adequate firefighting equipment on site, and complies with applicable federal, local, and state fire prevention regulations. Adequate fire prevention and protection practices include, but may not be limited to:

- Earthmoving and portable equipment with internal combustion engines shall be equipped with a properly-maintained spark arrestor to reduce the potential for igniting a wildfire.
- For all work occurring between April 1 and December 1, or any other periods during which a high fire danger has been identified, restrictions are placed on equipment use. During periods of high fire danger, equipment that could produce a spark, fire, or flame shall not be used within 10 feet of any flammable materials, and portable tools powered by gasoline-fueled internal combustion engines shall not be used within 25 feet of any flammable materials.
- 100 feet of defensible space shall be established around the construction site, including mowing brush and grasses to a height of 4 inches or less, removing dead trees, tree trimming, establishing clearance between structures and trees and all combustible matter.
- All combustible materials must be stacked away from structures within the construction site and have all combustible growth cleared for 15 feet around the stack.
- During construction, the contractor must maintain an unobstructed horizontal clearance at access drives in accordance with fire code.

Significance Determination

Less than significant with mitigation incorporated.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

The proposed project would not involve the installation or maintenance of infrastructure that is typically associated with fire risk, such as roads, fuel breaks, emergency water sources, or power lines. The project would rely on existing roads for access during construction and operation and maintenance. Installation of the new sewer force main and construction of the multi-use pathway would occur within existing dirt pathways, parking lots, vacant land, and commercial and industrial developments, and construction areas would be returned to pre-construction conditions. There would be no impact.

Mitigation Measures

None required.

Significance Determination

No impact.

d) Expose people or structures to significant risks, including downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

The proposed project would be located within existing dirt pathways, parking lots, vacant land, and commercial and industrial developments. Pipelines would be installed below-grade and overlying ground surface would be restored to pre-construction conditions, resulting in no permanent impact on site drainage. The project would have a less than significant impact related to storm water runoff (see *Section 3.10 Hydrology and Water Quality*). No impact would occur.

Mitigation Measures

None required.

Significance Determination

No impact.

3.21 Mandatory Findings of Significance

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

Discussion

a) Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Potential construction impacts on special-status species, migratory nesting birds, riparian habitat, and wetlands would be reduced to a less than significant level through the implementation of **Mitigation Measures BIO-1a, 1b, 1c, 1d, 1e, Mitigation Measure BIO-2,** and **Mitigation Measures BIO-3a and 3b**. Because geologic deposits underlying the project are less than 5,000 years old and are unlikely to contain significant prehistoric resources, there is a low possibility of encountering paleontological resources during construction of the project; impacts would be less than significant with implementation of **Mitigation Measures PALEO-1**. Due to the developed nature of the project area, there is a low potential for the discovery of archaeological materials during ground-disturbing activities. Nonetheless, implementation of **Mitigation Measure CUL-1** and **CUL-2** would reduce potentially significant impacts on cultural resources from inadvertent discovery of archaeological resources during construction to a less than significant level. No known tribal cultural resources listed or determined eligible for listing in the California Register or included in a local register of historical resources would be impacted by the project. Implementation of **Mitigation Measure CUL-1** through **Mitigation Measure CUL-3** and **Mitigation Measure TCR-1** would ensure that proper procedures are in place in the event previously unrecorded tribal cultural resources were identified during construction. Impacts would be reduced to a less than significant level. With the implementation of mitigation measures, the proposed project would have a less than significant impact on the quality of the environment.

Mitigation Measures

See **Mitigation Measures BIO-1a, BIO-1b, BIO-1c, BIO-1d, BIO-1e, BIO-2, BIO-3a, BIO-3b, CUL-1, CUL-2, CUL-3, PALEO-1, TCR-1**

Significance Determination

Less than significant with mitigation incorporated.

b) Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

According to the CEQA Guidelines, 15065(a)(3), "cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

According to CEQA Guidelines Section 15130(b) there are two approaches to discussing cumulative project impacts: the *List-of-Projects* method (a list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency); or the *Summary-of-Projections* method (a summary of projections contained in an adopted general plan or related planning document or in a prior environmental document that has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency. The City is relying on the Summary-of-Projections method for the purposes of this analysis.

The City's Capital Improvements Projects (CIP) Division manages various construction projects that improve city-owned properties and infrastructure. Currently, there are nine CIP projects that are under construction, 15 projects in design (including the proposed project), and four are in the planning stage (City of Petaluma n.d.). Construction of the projects in the city would occur at different times and/or sites far enough removed from each other that construction related cumulative effects such as dust and construction noise would be less than significant. Development would adhere to applicable rules and regulations related to dust suppression, traffic control, storm water control, handling/storage of hazardous materials, and regulations related to protections for plants/animals/waters of the State and U.S. Cumulative impacts in these areas are also considered less than significant. The only operational vehicle trips associated with the projects would be the infrequent monitoring/maintenance trips, which would result in an insignificant cumulative increase on area roadways separated in time and distance. Cumulative noise, air quality, and greenhouse gas effects from these projects would also be less than significant due to their minimal contribution and adherence to dust control and GHG reduction best management practices (**Mitigation Measure AIR-1** and **GHG-1**). Therefore, these projects are not expected to create impacts that are individually limited, but cumulatively considerable.

As described in Section 3.1 through Section 3.20, all resource topics associated with the proposed project have been analyzed in accordance with the CEQA and the State CEQA Guidelines and were found to pose no impact, less than significant impact, or less than significant impact with mitigation incorporated. No potentially significant impact would occur from project implementation. Therefore, cumulative impacts of the proposed project would be less than significant.

Mitigation Measures

See **Mitigation Measures AIR-1, GHG-1**.

Significance Determination

Less than significant with mitigation incorporated.

c) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Construction of the proposed project has the potential to result in various temporary impacts on human beings. Lighting produced during nighttime construction activities has the potential to affect nighttime views at the surrounding properties. Implementation of **Mitigation Measure AES-1** would require a Construction Safety Lighting Plan and would reduce impacts to less than significant. When soil-disturbing activities occur within 100 feet of residences, schools, or other sensitive receptors, there is a potential for construction-related dust to cause impacts. **Mitigation Measure AIR-2** would ensure BAAQMD's enhanced best management practices for construction-related fugitive dust emissions are implemented to reduce impacts on sensitive receptors to less than significant. Although all existing applicable regulations would be followed, there is potential for hazardous materials associated with typical construction activities to be released during construction. Implementation of **Mitigation Measures HAZ-1** and **HAZ-2** would minimize the risk of hazardous material exposure through material use and accidents and reduce impacts to less than significant. The project may exceed established noise standards during construction. Implementation of **Mitigation Measures NOI-1** and **NOI-2** require noise reduction measures and would reduce impacts to less than significant. Construction impacts would be temporary and have a limited footprint but would require temporary closures of roadways, bicycle lanes, and sidewalks. Potential impacts related to these closures would be minimized through the implementation of a Traffic Control Plan, as described in **Mitigation Measure TRA-1**, which would ensure that appropriate traffic controls are implemented. Implementation of **Mitigation Measure TRA-1** would reduce impacts to less than significant. Construction has the potential to exacerbate wildfire risks. The proposed project's impacts related to wildfire risk, and the exposure of project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire would be less than significant with **Mitigation Measure FIR-1**, requiring fire prevention and protection practices incorporated.

After construction is complete, the project poses a risk to humans from seismic ground shaking, ground failure, and landslides. Implementation of **Mitigation Measure GEO-1** would require a geotechnical report be prepared and followed, thus reducing impacts to less than significant.

The impacts of the proposed project have been analyzed in accordance with the CEQA Guidelines; each topic has been found to have either no impact, a less than significant impact, or a less than significant impact with mitigation incorporated. Therefore, with the implementation of the mitigation measures noted above, the project would not result in any environmental effects that would cause substantial adverse effects on human beings either directly or indirectly.

Mitigation Measures

See **Mitigation Measures AES-2, AIR-2, GEO-1, HAZ-1, HAZ-2, NOI-1, NOI-2, NOI-3, TRA-1, and FIR-1**.

Significance Determination

Less than significant with mitigation incorporated.

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4. REPORT PREPARATION

4.1 Report Authors

This report was prepared by the City, Woodard & Curran, and teaming partners. Staff from these agencies and companies that were involved include:

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APPENDIX A: CALEEMOD OUTPUT

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	PIPS Parallel Force Main Project
Construction Start Date	2/11/2025
Lead Agency	City of Petaluma
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.6
Precipitation (days)	42.4
Location	3890 Cypress Dr, Petaluma, CA 94954, USA
County	Sonoma-San Francisco
City	Petaluma
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	983
EDFZ	2
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.20

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Ar	Landscape	Special La	Population	Description
Other Asphalt Surfaces	3.58	Acre	3.58	0	0			

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-5	Use Advanced Engine Tiers
Construction	C-10-A	Water Exposed Surfaces
Construction	C-10-C	Water Unpaved Construction Roads
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads
Construction	C-12	Sweep Paved Roads
Construction	C-13	Use Low-VOC Paints for Construction

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Un/Mit.	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Unmit.	9.94	8.26	71.7	81.4	0.16	3.13	8.01	11.1	2.88	3.66	6.54		16092	16092	0.69	0.48	6.26	16257
Mit.	5.11	4.38	41.9	86.8	0.16	1.63	3.68	5.3	1.51	1.57	3.09		16092	16092	0.69	0.48	6.26	16257
% Reduced	48.6	47.1	41.6	−6.63		48	54.1	52.4	47.5	57.1	52.9							
Daily, Winter (Max)																		
Unmit.	8.41	6.99	61.3	68.7	0.13	2.74	8.1	10.6	2.53	3.69	6.16		12605	12605	0.54	0.42	0.17	12743
Mit.	4.73	4.01	39	68.6	0.13	1.56	3.77	5.12	1.45	1.6	2.99		12605	12605	0.54	0.42	0.17	12743
% Reduced	43.7	42.6	36.4	0.21		43	53.5	51.8	42.6	56.7	51.4							
Average Daily (Max)																		

Unmit.		4.24	3.52	31.5	35.9	0.07	1.34	5.04	6.38	1.24	2.31	3.55		7269	7269	0.32	0.27	1.63	7358
Mit.		1.9	1.63	15.7	37.5	0.07	0.56	2.29	2.85	0.52	0.99	1.51		7269	7269	0.32	0.27	1.63	7358
% Reduced		55.2	53.7	50.2	−4.64		58.5	54.5	55.3	57.9	57.3	57.5							
Annual (Max)																			
Unmit.		0.77	0.64	5.75	6.54	0.01	0.25	0.92	1.16	0.23	0.42	0.65		1203	1203	0.05	0.04	0.27	1218
Mit.		0.35	0.3	2.86	6.85	0.01	0.1	0.42	0.52	0.1	0.18	0.28		1203	1203	0.05	0.04	0.27	1218
% Reduced		55.2	53.7	50.2	−4.64		58.5	54.5	55.3	57.9	57.3	57.5							
Exceeds (Daily Max)																			
Threshold			54	54			82			54									
Unmit.			No	Yes			No			No									
Mit.			No	No			No			No									
Exceeds (Average Daily)																			
Threshold			54	54			82			54									
Unmit.			No	No			No			No									
Mit.			No	No			No			No									

2.2. Construction Emissions by Year, Unmitigated

Year		TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily - Summer (Max)																			
	2025	9.94	8.26	71.7	81.4	0.16	3.13	8.01	11.1	2.88	3.66	6.54		16092	16092	0.69	0.48	6.26	16257
Daily - Winter (Max)																			
	2025	8.41	6.99	61.3	68.7	0.13	2.74	8.1	10.6	2.53	3.69	6.16		12605	12605	0.54	0.42	0.17	12743
	2026	4.45	3.69	34.3	42.7	0.08	1.31	8.1	9.41	1.21	3.69	4.89		9309	9309	0.4	0.42	0.16	9444
Average Daily																			
	2025	4.24	3.52	31.5	35.9	0.07	1.34	5.04	6.38	1.24	2.31	3.55		7269	7269	0.32	0.27	1.63	7358
	2026	0.46	0.38	3.55	4.31	0.01	0.14	1.06	1.2	0.13	0.49	0.62		961	961	0.04	0.05	0.3	977
Annual																			
	2025	0.77	0.64	5.75	6.54	0.01	0.25	0.92	1.16	0.23	0.42	0.65		1203	1203	0.05	0.04	0.27	1218
	2026	0.08	0.07	0.65	0.79	< 0.005	0.03	0.19	0.22	0.02	0.09	0.11		159	159	0.01	0.01	0.05	162

2.3. Construction Emissions by Year, Mitigated

Year		TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily - Summer (Max)																			
	2025	5.11	4.38	41.9	86.8	0.16	1.63	3.68	5.3	1.51	1.57	3.09		16092	16092	0.69	0.48	6.26	16257
Daily - Winter (Max)																			
	2025	4.73	4.01	39	68.6	0.13	1.56	3.77	5.12	1.45	1.6	2.99		12605	12605	0.54	0.42	0.17	12743
	2026	1.26	1.12	10.2	45.4	0.08	0.2	3.77	3.97	0.2	1.6	1.79		9309	9309	0.4	0.42	0.16	9444
Average Daily																			
	2025	1.9	1.63	15.7	37.5	0.07	0.56	2.29	2.85	0.52	0.99	1.51		7269	7269	0.32	0.27	1.63	7358
	2026	0.12	0.11	1.03	4.48	0.01	0.02	0.48	0.5	0.02	0.21	0.23		961	961	0.04	0.05	0.3	977
Annual																			
	2025	0.35	0.3	2.86	6.85	0.01	0.1	0.42	0.52	0.1	0.18	0.28		1203	1203	0.05	0.04	0.27	1218
	2026	0.02	0.02	0.19	0.82	< 0.005	< 0.005	0.09	0.09	< 0.005	0.04	0.04		159	159	0.01	0.01	0.05	162

3. Construction Emissions Details

3.1. Trenching (2025) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		

Daily, Summer (Max)																		
Off-Road Equipment	2.07	1.74	16.3	17.9	0.03	0.72		0.72	0.66		0.66		2959	2959	0.12	0.02		2970
Dust From Material Movement							7.09	7.09		3.43	3.43							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Daily, Winter (Max)																		
Off-Road Equipment	2.07	1.74	16.3	17.9	0.03	0.72		0.72	0.66		0.66		2959	2959	0.12	0.02		2970
Dust From Material Movement							7.09	7.09		3.43	3.43							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	1.32	1.11	10.3	11.4	0.02	0.46		0.46	0.42		0.42		1876	1876	0.08	0.02		1883
Dust From Material Movement							4.5	4.5		2.17	2.17							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.24	0.2	1.88	2.07	< 0.005	0.08		0.08	0.08		0.08		311	311	0.01	< 0.005		312
Dust From Material Movement							0.82	0.82		0.4	0.4							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Worker	0.07	0.06	0.05	0.73	0	0	0.12	0.12	0	0.03	0.03		131	131	0.01	0.01	0.55	133
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.08	0.02	1.36	0.54	0.01	0.01	0.24	0.25	0.01	0.07	0.08		990	990	0.05	0.16	2.02	1040
Daily, Winter (Max)																		
Worker	0.06	0.06	0.06	0.65	0	0	0.12	0.12	0	0.03	0.03		122	122	< 0.005	0.01	0.01	123
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.08	0.02	1.44	0.54	0.01	0.01	0.24	0.25	0.01	0.07	0.08		990	990	0.05	0.16	0.05	1038
Average Daily																		
Worker	0.04	0.04	0.03	0.4	0	0	0.08	0.08	0	0.02	0.02		77.8	77.8	< 0.005	< 0.005	0.15	79.1
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.05	0.01	0.9	0.34	0.01	0.01	0.15	0.15	0.01	0.04	0.05		628	628	0.03	0.1	0.56	659
Annual																		
Worker	0.01	0.01	0.01	0.07	0	0	0.01	0.01	0	< 0.005	< 0.005		12.9	12.9	< 0.005	< 0.005	0.02	13.1
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.01	< 0.005	0.16	0.06	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01		104	104	0.01	0.02	0.09	109

3.2. Trenching (2025) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Off-Road Equipment	0.29	0.29	2.04	17.8	0.03	0.06		0.06	0.06		0.06		2959	2959	0.12	0.02		2970
Dust From Material Movement							2.77	2.77		1.34	1.34							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Daily, Winter (Max)																		
Off-Road Equipment	0.29	0.29	2.04	17.8	0.03	0.06		0.06	0.06		0.06		2959	2959	0.12	0.02		2970
Dust From Material Movement							2.77	2.77		1.34	1.34							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	0.18	0.18	1.3	11.3	0.02	0.04		0.04	0.04		0.04		1876	1876	0.08	0.02		1883
Dust From Material Movement							1.75	1.75		0.85	0.85							

Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.03	0.03	0.24	2.06	< 0.005	0.01		0.01	0.01		0.01		311	311	0.01	< 0.005		312
Dust From Material Movement							0.32	0.32		0.15	0.15							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Worker	0.07	0.06	0.05	0.73	0	0	0.12	0.12	0	0.03	0.03		131	131	0.01	0.01	0.55	133
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.08	0.02	1.36	0.54	0.01	0.01	0.24	0.25	0.01	0.07	0.08		990	990	0.05	0.16	2.02	1040
Daily, Winter (Max)																		
Worker	0.06	0.06	0.06	0.65	0	0	0.12	0.12	0	0.03	0.03		122	122	< 0.005	0.01	0.01	123
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.08	0.02	1.44	0.54	0.01	0.01	0.24	0.25	0.01	0.07	0.08		990	990	0.05	0.16	0.05	1038
Average Daily																		
Worker	0.04	0.04	0.03	0.4	0	0	0.08	0.08	0	0.02	0.02		77.8	77.8	< 0.005	< 0.005	0.15	79.1
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.05	0.01	0.9	0.34	0.01	0.01	0.15	0.15	0.01	0.04	0.05		628	628	0.03	0.1	0.56	659
Annual																		
Worker	0.01	0.01	0.01	0.07	0	0	0.01	0.01	0	< 0.005	< 0.005		12.9	12.9	< 0.005	< 0.005	0.02	13.1
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.01	< 0.005	0.16	0.06	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01		104	104	0.01	0.02	0.09	109

3.3. Trenching (2026) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment	1.96	1.65	15	17.4	0.03	0.65		0.65	0.59		0.59		2960	2960	0.12	0.02		2970
Dust From Material Movement							7.09	7.09		3.43	3.43							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	0.26	0.22	2.02	2.35	< 0.005	0.09		0.09	0.08		0.08		400	400	0.02	< 0.005		401
Dust From Material Movement							0.96	0.96		0.46	0.46							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.05	0.04	0.37	0.43	< 0.005	0.02		0.02	0.01		0.01		66.2	66.2	< 0.005	< 0.005		66.4
Dust From Material Movement							0.17	0.17		0.08	0.08							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.06	0.06	0.06	0.61	0	0	0.12	0.12	0	0.03	0.03		120	120	< 0.005	0.01	0.01	121
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.07	0.02	1.37	0.52	0.01	0.01	0.24	0.25	0.01	0.07	0.08		971	971	0.05	0.16	0.05	1019
Average Daily																		
Worker	0.01	0.01	0.01	0.08	0	0	0.02	0.02	0	< 0.005	< 0.005		16.3	16.3	< 0.005	< 0.005	0.03	16.5
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0

Hauling	0.01	< 0.005	0.18	0.07	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01		131	131	0.01	0.02	0.11	138
Annual																		
Worker	< 0.005	< 0.005	< 0.005	0.01	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		2.69	2.69	< 0.005	< 0.005	< 0.005	2.74
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		21.7	21.7	< 0.005	< 0.005	0.02	22.8

3.4. Trenching (2026) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment	0.29	0.29	2.04	17.8	0.03	0.06		0.06	0.06		0.06		2960	2960	0.12	0.02		2970
Dust From Material Movement							2.77	2.77		1.34	1.34							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	0.04	0.04	0.28	2.4	< 0.005	0.01		0.01	0.01		0.01		400	400	0.02	< 0.005		401
Dust From Material Movement							0.37	0.37		0.18	0.18							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.01	0.01	0.05	0.44	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		66.2	66.2	< 0.005	< 0.005		66.4
Dust From Material Movement							0.07	0.07		0.03	0.03							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.06	0.06	0.06	0.61	0	0	0.12	0.12	0	0.03	0.03		120	120	< 0.005	0.01	0.01	121
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.07	0.02	1.37	0.52	0.01	0.01	0.24	0.25	0.01	0.07	0.08		971	971	0.05	0.16	0.05	1019
Average Daily																		
Worker	0.01	0.01	0.01	0.08	0	0	0.02	0.02	0	< 0.005	< 0.005		16.3	16.3	< 0.005	< 0.005	0.03	16.5
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.01	< 0.005	0.18	0.07	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01		131	131	0.01	0.02	0.11	138
Annual																		
Worker	< 0.005	< 0.005	< 0.005	0.01	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		2.69	2.69	< 0.005	< 0.005	< 0.005	2.74
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		21.7	21.7	< 0.005	< 0.005	0.02	22.8

3.5. MT Shafts (2025) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Off-Road Equipment	1.47	1.23	10.3	11.9	0.03	0.38		0.38	0.35		0.35		3187	3187	0.13	0.03		3198
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Daily, Winter (Max)																		
Average Daily																		
Off-Road Equipment	0.36	0.3	2.53	2.94	0.01	0.09		0.09	0.09		0.09		786	786	0.03	0.01		788
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							

Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.07	0.06	0.46	0.54	< 0.005	0.02		0.02	0.02		0.02		130	130	0.01	< 0.005		131
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Worker	0.04	0.03	0.02	0.39	0	0	0.07	0.07	0	0.02	0.02		69.7	69.7	< 0.005	< 0.005	0.29	70.9
Vendor	< 0.005	< 0.005	0.07	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		55.5	55.5	< 0.005	0.01	0.14	58.1
Hauling	0.01	< 0.005	0.21	0.08	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01		152	152	0.01	0.02	0.31	160
Daily, Winter (Max)																		
Average Daily																		
Worker	0.01	0.01	0.01	0.08	0	0	0.02	0.02	0	< 0.005	< 0.005		16.1	16.1	< 0.005	< 0.005	0.03	16.4
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		13.7	13.7	< 0.005	< 0.005	0.02	14.3
Hauling	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		37.6	37.6	< 0.005	0.01	0.03	39.4
Annual																		
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		2.67	2.67	< 0.005	< 0.005	0.01	2.72
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		2.26	2.26	< 0.005	< 0.005	< 0.005	2.37
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		6.22	6.22	< 0.005	< 0.005	0.01	6.53

3.6. MT Shafts (2025) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Off-Road Equipment	0.32	0.32	2.76	17.5	0.03	0.06		0.06	0.06		0.06		3187	3187	0.13	0.03		3198
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Daily, Winter (Max)																		
Average Daily																		
Off-Road Equipment	0.08	0.08	0.68	4.31	0.01	0.01		0.01	0.01		0.01		786	786	0.03	0.01		788
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.01	0.01	0.12	0.79	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		130	130	0.01	< 0.005		131
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Worker	0.04	0.03	0.02	0.39	0	0	0.07	0.07	0	0.02	0.02		69.7	69.7	< 0.005	< 0.005	0.29	70.9
Vendor	< 0.005	< 0.005	0.07	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		55.5	55.5	< 0.005	0.01	0.14	58.1
Hauling	0.01	< 0.005	0.21	0.08	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01		152	152	0.01	0.02	0.31	160
Daily, Winter (Max)																		
Average Daily																		
Worker	0.01	0.01	0.01	0.08	0	0	0.02	0.02	0	< 0.005	< 0.005		16.1	16.1	< 0.005	< 0.005	0.03	16.4
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		13.7	13.7	< 0.005	< 0.005	0.02	14.3
Hauling	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		37.6	37.6	< 0.005	0.01	0.03	39.4
Annual																		
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		2.67	2.67	< 0.005	< 0.005	0.01	2.72

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		2.26	2.26	< 0.005	< 0.005	< 0.005	2.37
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		6.22	6.22	< 0.005	< 0.005	0.01	6.53

3.7. Microtunneling (2025) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Off-Road Equipment	5.16	4.31	35.5	39.2	0.06	1.71		1.71	1.57		1.57		5979	5979	0.24	0.05		6000
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Daily, Winter (Max)																		
Off-Road Equipment	5.16	4.31	35.5	39.2	0.06	1.71		1.71	1.57		1.57		5979	5979	0.24	0.05		6000
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	1.63	1.36	11.2	12.4	0.02	0.54		0.54	0.5		0.5		1884	1884	0.08	0.02		1890
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.3	0.25	2.04	2.26	< 0.005	0.1		0.1	0.09		0.09		312	312	0.01	< 0.005		313
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Worker	0.01	0.01	0.01	0.15	0	0	0.02	0.02	0	0.01	0.01		26.1	26.1	< 0.005	< 0.005	0.11	26.6
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		27.7	27.7	< 0.005	< 0.005	0.07	29
Hauling	0.01	< 0.005	0.1	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01		76.1	76.1	< 0.005	0.01	0.16	80
Daily, Winter (Max)																		
Worker	0.01	0.01	0.01	0.13	0	0	0.02	0.02	0	0.01	0.01		24.4	24.4	< 0.005	< 0.005	< 0.005	24.7
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		27.7	27.7	< 0.005	< 0.005	< 0.005	29
Hauling	0.01	< 0.005	0.11	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01		76.2	76.2	< 0.005	0.01	< 0.005	79.9
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005	0.04	0	0	0.01	0.01	0	< 0.005	< 0.005		7.74	7.74	< 0.005	< 0.005	0.01	7.86
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		8.74	8.74	< 0.005	< 0.005	0.01	9.14
Hauling	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		24	24	< 0.005	< 0.005	0.02	25.2
Annual																		
Worker	< 0.005	< 0.005	< 0.005	0.01	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		1.28	1.28	< 0.005	< 0.005	< 0.005	1.3
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.45	1.45	< 0.005	< 0.005	< 0.005	1.51
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		3.97	3.97	< 0.005	< 0.005	< 0.005	4.17

3.8. Microtunneling (2025) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Off-Road Equipment	3.89	3.29	31.8	38.7	0.06	1.44		1.44	1.32		1.32		5979	5979	0.24	0.05		6000
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Daily, Winter (Max)																		
Off-Road Equipment	3.89	3.29	31.8	38.7	0.06	1.44		1.44	1.32		1.32		5979	5979	0.24	0.05		6000
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	1.23	1.04	10	12.2	0.02	0.45		0.45	0.42		0.42		1884	1884	0.08	0.02		1890
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0

Annual																		
Off-Road Equipment	0.22	0.19	1.83	2.23	< 0.005	0.08		0.08	0.08		0.08		312	312	0.01	< 0.005		313
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Worker	0.01	0.01	0.01	0.15	0	0	0.02	0.02	0	0.01	0.01		26.1	26.1	< 0.005	< 0.005	0.11	26.6
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		27.7	27.7	< 0.005	< 0.005	0.07	29
Hauling	0.01	< 0.005	0.1	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01		76.1	76.1	< 0.005	0.01	0.16	80
Daily, Winter (Max)																		
Worker	0.01	0.01	0.01	0.13	0	0	0.02	0.02	0	0.01	0.01		24.4	24.4	< 0.005	< 0.005	< 0.005	24.7
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		27.7	27.7	< 0.005	< 0.005	< 0.005	29
Hauling	0.01	< 0.005	0.11	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01		76.2	76.2	< 0.005	0.01	< 0.005	79.9
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005	0.04	0	0	0.01	0.01	0	< 0.005	< 0.005		7.74	7.74	< 0.005	< 0.005	0.01	7.86
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		8.74	8.74	< 0.005	< 0.005	0.01	9.14
Hauling	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		24	24	< 0.005	< 0.005	0.02	25.2
Annual																		
Worker	< 0.005	< 0.005	< 0.005	0.01	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		1.28	1.28	< 0.005	< 0.005	< 0.005	1.3
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.45	1.45	< 0.005	< 0.005	< 0.005	1.51
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		3.97	3.97	< 0.005	< 0.005	< 0.005	4.17

3.9. PIPS and ECWRF (2025) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment	1.35	1.13	10.4	13	0.02	0.43		0.43	0.4		0.4		2398	2398	0.1	0.02		2406
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	0.17	0.15	1.35	1.68	< 0.005	0.06		0.06	0.05		0.05		310	310	0.01	< 0.005		311
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.03	0.03	0.25	0.31	< 0.005	0.01		0.01	0.01		0.01		51.3	51.3	< 0.005	< 0.005		51.4
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.1	0.09	0.09	1	0	0	0.19	0.19	0	0.04	0.04		187	187	0.01	0.01	0.02	189
Vendor	0.02	0.01	0.39	0.15	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02		277	277	0.01	0.04	0.02	290
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Worker	0.01	0.01	0.01	0.13	0	0	0.02	0.02	0	0.01	0.01		24.3	24.3	< 0.005	< 0.005	0.05	24.7
Vendor	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		35.8	35.8	< 0.005	0.01	0.04	37.5
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		4.02	4.02	< 0.005	< 0.005	0.01	4.09
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		5.93	5.93	< 0.005	< 0.005	0.01	6.2
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0

3.10. PIPS and ECWRF (2025) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment	0.35	0.33	2.82	14.8	0.02	0.08		0.08	0.07		0.07		2398	2398	0.1	0.02		2406
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	0.05	0.04	0.36	1.91	< 0.005	0.01		0.01	0.01		0.01		310	310	0.01	< 0.005		311
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.01	0.01	0.07	0.35	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		51.3	51.3	< 0.005	< 0.005		51.4
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.1	0.09	0.09	1	0	0	0.19	0.19	0	0.04	0.04		187	187	0.01	0.01	0.02	189
Vendor	0.02	0.01	0.39	0.15	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02		277	277	0.01	0.04	0.02	290
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Worker	0.01	0.01	0.01	0.13	0	0	0.02	0.02	0	0.01	0.01		24.3	24.3	< 0.005	< 0.005	0.05	24.7
Vendor	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		35.8	35.8	< 0.005	0.01	0.04	37.5
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		4.02	4.02	< 0.005	< 0.005	0.01	4.09
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		5.93	5.93	< 0.005	< 0.005	0.01	6.2
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0

3.11. PIPS and ECWRF (2026) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment	1.28	1.07	9.85	13	0.02	0.38		0.38	0.35		0.35		2397	2397	0.1	0.02		2405
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	0.04	0.03	0.31	0.41	< 0.005	0.01		0.01	0.01		0.01		75.1	75.1	< 0.005	< 0.005		75.3
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.01	0.01	0.06	0.07	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		12.4	12.4	< 0.005	< 0.005		12.5
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.09	0.09	0.09	0.93	0	0	0.19	0.19	0	0.04	0.04		183	183	0.01	0.01	0.02	186
Vendor	0.02	0.01	0.37	0.15	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02		273	273	0.01	0.04	0.02	285
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0

Average Daily																		
Worker	< 0.005	< 0.005	< 0.005	0.03	0	0	0.01	0.01	0	< 0.005	< 0.005		5.79	5.79	< 0.005	< 0.005	0.01	5.87
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		8.54	8.54	< 0.005	< 0.005	0.01	8.93
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Worker	< 0.005	< 0.005	< 0.005	0.01	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		0.96	0.96	< 0.005	< 0.005	< 0.005	0.97
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.41	1.41	< 0.005	< 0.005	< 0.005	1.48
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0

3.12. PIPS and ECWRF (2026) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment	0.35	0.33	2.82	14.8	0.02	0.07		0.07	0.07		0.07		2397	2397	0.1	0.02		2405
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	0.01	0.01	0.09	0.46	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		75.1	75.1	< 0.005	< 0.005		75.3
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	< 0.005	< 0.005	0.02	0.08	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		12.4	12.4	< 0.005	< 0.005		12.5
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.09	0.09	0.09	0.93	0	0	0.19	0.19	0	0.04	0.04		183	183	0.01	0.01	0.02	186
Vendor	0.02	0.01	0.37	0.15	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02		273	273	0.01	0.04	0.02	285
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005	0.03	0	0	0.01	0.01	0	< 0.005	< 0.005		5.79	5.79	< 0.005	< 0.005	0.01	5.87
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		8.54	8.54	< 0.005	< 0.005	0.01	8.93
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Worker	< 0.005	< 0.005	< 0.005	0.01	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		0.96	0.96	< 0.005	< 0.005	< 0.005	0.97
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.41	1.41	< 0.005	< 0.005	< 0.005	1.48
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0

3.13. Restoration (2025) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Off-Road Equipment	0.85	0.71	6.52	8.84	0.01	0.29		0.29	0.26		0.26		1351	1351	0.05	0.01		1355
Dust From Material Movement							0.01	0.01		< 0.005	< 0.005							
Paving		0.03																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Daily, Winter (Max)																		
Off-Road Equipment	0.85	0.71	6.52	8.84	0.01	0.29		0.29	0.26		0.26		1351	1351	0.05	0.01		1355
Dust From Material Movement							0.01	0.01		< 0.005	< 0.005							

Paving		0.03																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	0.54	0.45	4.13	5.61	0.01	0.18		0.18	0.17		0.17		856	856	0.03	0.01		859
Dust From Material Movement							0.01	0.01		< 0.005	< 0.005							
Paving		0.02																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.1	0.08	0.75	1.02	< 0.005	0.03		0.03	0.03		0.03		142	142	0.01	< 0.005		142
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Paving		< 0.005																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Worker	0.09	0.08	0.06	0.98	0	0	0.17	0.17	0	0.04	0.04		174	174	0.01	0.01	0.73	177
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.07	0.02	1.26	0.49	0.01	0.01	0.22	0.23	0.01	0.06	0.07		914	914	0.05	0.15	1.87	960
Daily, Winter (Max)																		
Worker	0.09	0.08	0.08	0.87	0	0	0.17	0.17	0	0.04	0.04		162	162	< 0.005	0.01	0.02	165
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.07	0.02	1.33	0.5	0.01	0.01	0.22	0.23	0.01	0.06	0.07		914	914	0.05	0.15	0.05	959
Average Daily																		
Worker	0.05	0.05	0.05	0.53	0	0	0.1	0.1	0	0.02	0.02		104	104	0.01	< 0.005	0.2	105
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.05	0.01	0.83	0.31	0.01	0.01	0.13	0.14	0.01	0.04	0.04		579	579	0.03	0.09	0.51	608
Annual																		
Worker	0.01	0.01	0.01	0.1	0	0	0.02	0.02	0	< 0.005	< 0.005		17.2	17.2	< 0.005	< 0.005	0.03	17.5
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.01	< 0.005	0.15	0.06	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01		95.9	95.9	0.01	0.02	0.08	101

3.14. Restoration (2025) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Off-Road Equipment	0.23	0.21	2.14	9.35	0.01	0.05		0.05	0.05		0.05		1351	1351	0.05	0.01		1355
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Paving		0.03																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Daily, Winter (Max)																		
Off-Road Equipment	0.23	0.21	2.14	9.35	0.01	0.05		0.05	0.05		0.05		1351	1351	0.05	0.01		1355
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Paving		0.03																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	0.15	0.14	1.35	5.93	0.01	0.03		0.03	0.03		0.03		856	856	0.03	0.01		859
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Paving		0.02																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0

Annual																		
Off-Road Equipment	0.03	0.02	0.25	1.08	< 0.005	0.01		0.01	0.01		0.01		142	142	0.01	< 0.005		142
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Paving		< 0.005																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Worker	0.09	0.08	0.06	0.98	0	0	0.17	0.17	0	0.04	0.04		174	174	0.01	0.01	0.73	177
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.07	0.02	1.26	0.49	0.01	0.01	0.22	0.23	0.01	0.06	0.07		914	914	0.05	0.15	1.87	960
Daily, Winter (Max)																		
Worker	0.09	0.08	0.08	0.87	0	0	0.17	0.17	0	0.04	0.04		162	162	< 0.005	0.01	0.02	165
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.07	0.02	1.33	0.5	0.01	0.01	0.22	0.23	0.01	0.06	0.07		914	914	0.05	0.15	0.05	959
Average Daily																		
Worker	0.05	0.05	0.05	0.53	0	0	0.1	0.1	0	0.02	0.02		104	104	0.01	< 0.005	0.2	105
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.05	0.01	0.83	0.31	0.01	0.01	0.13	0.14	0.01	0.04	0.04		579	579	0.03	0.09	0.51	608
Annual																		
Worker	0.01	0.01	0.01	0.1	0	0	0.02	0.02	0	< 0.005	< 0.005		17.2	17.2	< 0.005	< 0.005	0.03	17.5
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.01	< 0.005	0.15	0.06	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01		95.9	95.9	0.01	0.02	0.08	101

3.15. Restoration (2026) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment	0.81	0.68	6.23	8.81	0.01	0.26		0.26	0.24		0.24		1350	1350	0.05	0.01		1355
Dust From Material Movement							0.01	0.01		< 0.005	< 0.005							
Paving		0.03																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	0.11	0.09	0.84	1.19	< 0.005	0.04		0.04	0.03		0.03		182	182	0.01	< 0.005		183
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Paving		< 0.005																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.02	0.02	0.15	0.22	< 0.005	0.01		0.01	0.01		0.01		30.2	30.2	< 0.005	< 0.005		30.3
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Paving		< 0.005																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.08	0.07	0.07	0.81	0	0	0.17	0.17	0	0.04	0.04		159	159	< 0.005	0.01	0.02	162
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.07	0.02	1.27	0.48	0.01	0.01	0.22	0.23	0.01	0.06	0.07		896	896	0.05	0.15	0.05	941

Average Daily																		
Worker	0.01	0.01	0.01	0.11	0	0	0.02	0.02	0	0.01	0.01		21.7	21.7	< 0.005	< 0.005	0.04	22
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.01	< 0.005	0.17	0.06	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01		121	121	0.01	0.02	0.1	127
Annual																		
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		3.59	3.59	< 0.005	< 0.005	0.01	3.65
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		20	20	< 0.005	< 0.005	0.02	21.1

3.16. Restoration (2026) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment	0.23	0.21	2.14	9.35	0.01	0.05		0.05	0.05		0.05		1350	1350	0.05	0.01		1355
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Paving		0.03																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	0.03	0.03	0.29	1.26	< 0.005	0.01		0.01	0.01		0.01		182	182	0.01	< 0.005		183
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Paving		< 0.005																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.01	0.01	0.05	0.23	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		30.2	30.2	< 0.005	< 0.005		30.3
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Paving		< 0.005																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.08	0.07	0.07	0.81	0	0	0.17	0.17	0	0.04	0.04		159	159	< 0.005	0.01	0.02	162
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.07	0.02	1.27	0.48	0.01	0.01	0.22	0.23	0.01	0.06	0.07		896	896	0.05	0.15	0.05	941
Average Daily																		
Worker	0.01	0.01	0.01	0.11	0	0	0.02	0.02	0	0.01	0.01		21.7	21.7	< 0.005	< 0.005	0.04	22
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.01	< 0.005	0.17	0.06	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01		121	121	0.01	0.02	0.1	127
Annual																		
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		3.59	3.59	< 0.005	< 0.005	0.01	3.65
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		20	20	< 0.005	< 0.005	0.02	21.1

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Vegetation	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		

Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Species	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Avoided																		
Subtotal																		
Sequestered																		
Subtotal																		
Removed																		
Subtotal																		
Daily, Winter (Max)																		
Avoided																		
Subtotal																		
Sequestered																		
Subtotal																		
Removed																		
Subtotal																		
Annual																		
Avoided																		
Subtotal																		
Sequestered																		
Subtotal																		
Removed																		
Subtotal																		

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Vegetation	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		

Annual
Total

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Species	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Avoided																		
Subtotal																		
Sequestered																		
Subtotal																		
Removed																		
Subtotal																		
Daily, Winter (Max)																		
Avoided																		
Subtotal																		
Sequestered																		
Subtotal																		
Removed																		
Subtotal																		
Annual																		
Avoided																		
Subtotal																		
Sequestered																		
Subtotal																		
Removed																		
Subtotal																		

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per W	Work Days	Phase Description
Trenching	Grading	2/11/2025	3/10/2026	5	281	
MT Shafts	Building Constructio	4/3/2025	8/6/2025	5	90	
Microtunneling	Building Constructio	5/15/2025	#########	5	115	
PIPS and ECWRF	Building Constructio	#########	1/16/2026	5	60	
Restoration	Paving	2/11/2025	3/10/2026	5	281	

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number pe	Hours Per D	Horsepow	Load Factor
Trenching	Excavators	Diesel	Average	1	8	36	0.38
Trenching	Graders	Diesel	Average	1	8	148	0.41
Trenching	Rubber Tired Dozers	Diesel	Average	1	8	367	0.4
Trenching	Tractors/Loaders/Ba	Diesel	Average	3	8	84	0.37
MT Shafts	Tractors/Loaders/Ba	Diesel	Average	2	8	84	0.37
MT Shafts	Cranes	Diesel	Average	1	8	367	0.29
MT Shafts	Excavators	Diesel	Average	2	8	36	0.38
MT Shafts	Off-Highway Trucks	Diesel	Average	1	8	376	0.38
Microtunneling	Bore/Drill Rigs	Diesel	Average	1	24	46	0.45
Microtunneling	Cranes	Diesel	Average	1	4	367	0.29
Microtunneling	Air Compressors	Diesel	Average	2	24	37	0.48
Microtunneling	Generator Sets	Diesel	Average	1	24	14	0.74
Microtunneling	Pumps	Diesel	Average	2	24	11	0.74
Microtunneling	Tractors/Loaders/Ba	Diesel	Average	1	2	84	0.37
Microtunneling	Other Construction E	Diesel	Average	3	24	82	0.42
PIPS and ECWRF	Cranes	Diesel	Average	1	7	367	0.29
PIPS and ECWRF	Forklifts	Diesel	Average	3	8	82	0.2
PIPS and ECWRF	Generator Sets	Diesel	Average	1	8	14	0.74
PIPS and ECWRF	Tractors/Loaders/Ba	Diesel	Average	3	7	84	0.37
PIPS and ECWRF	Welders	Diesel	Average	1	8	46	0.45
Restoration	Cement and Mortar M	Diesel	Average	2	6	10	0.56
Restoration	Pavers	Diesel	Average	1	8	81	0.42
Restoration	Paving Equipment	Diesel	Average	2	6	89	0.36
Restoration	Rollers	Diesel	Average	2	6	36	0.38
Restoration	Tractors/Loaders/Ba	Diesel	Average	1	8	84	0.37

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number pe	Hours Per D	Horsepow	Load Factor
Trenching	Excavators	Diesel	Tier 4 Final	1	8	36	0.38
Trenching	Graders	Diesel	Tier 4 Final	1	8	148	0.41
Trenching	Rubber Tired Dozers	Diesel	Tier 4 Final	1	8	367	0.4
Trenching	Tractors/Loaders/Ba	Diesel	Tier 4 Final	3	8	84	0.37
MT Shafts	Tractors/Loaders/Ba	Diesel	Tier 4 Final	2	8	84	0.37
MT Shafts	Cranes	Diesel	Tier 4 Final	1	8	367	0.29
MT Shafts	Excavators	Diesel	Tier 4 Final	2	8	36	0.38
MT Shafts	Off-Highway Trucks	Diesel	Tier 4 Final	1	8	376	0.38
Microtunneling	Bore/Drill Rigs	Diesel	Average	1	24	46	0.45
Microtunneling	Cranes	Diesel	Tier 4 Final	1	4	367	0.29
Microtunneling	Air Compressors	Diesel	Tier 4 Final	2	24	37	0.48
Microtunneling	Generator Sets	Diesel	Average	1	24	14	0.74
Microtunneling	Pumps	Diesel	Average	2	24	11	0.74
Microtunneling	Tractors/Loaders/Ba	Diesel	Tier 4 Final	1	2	84	0.37
Microtunneling	Other Construction E	Diesel	Average	3	24	82	0.42
PIPS and ECWRF	Cranes	Diesel	Tier 4 Final	1	7	367	0.29
PIPS and ECWRF	Forklifts	Diesel	Tier 4 Final	3	8	82	0.2

PIPS and ECWRF	Generator Sets	Diesel	Average	1	8	14	0.74
PIPS and ECWRF	Tractors/Loaders/Ba	Diesel	Tier 4 Final	3	7	84	0.37
PIPS and ECWRF	Welders	Diesel	Tier 4 Final	1	8	46	0.45
Restoration	Cement and Mortar M	Diesel	Average	2	6	10	0.56
Restoration	Pavers	Diesel	Tier 4 Final	1	8	81	0.42
Restoration	Paving Equipment	Diesel	Tier 4 Final	2	6	89	0.36
Restoration	Rollers	Diesel	Tier 4 Final	2	6	36	0.38
Restoration	Tractors/Loaders/Ba	Diesel	Tier 4 Final	1	8	84	0.37

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Tr	Miles per Tri	Vehicle Mix
Trenching				
Trenching	Worker	15	11.7	LDA,LDT1,LDT2
Trenching	Vendor		8.4	HHDT,MHDT
Trenching	Hauling	13	20	HHDT
Trenching	Onsite truck			HHDT
MT Shafts				
MT Shafts	Worker	8	11.7	LDA,LDT1,LDT2
MT Shafts	Vendor	2	8.4	HHDT,MHDT
MT Shafts	Hauling	2	20	HHDT
MT Shafts	Onsite truck			HHDT
Restoration				
Restoration	Worker	20	11.7	LDA,LDT1,LDT2
Restoration	Vendor		8.4	HHDT,MHDT
Restoration	Hauling	12	20	HHDT
Restoration	Onsite truck			HHDT
Microtunneling				
Microtunneling	Worker	3	11.7	LDA,LDT1,LDT2
Microtunneling	Vendor	1	8.4	HHDT,MHDT
Microtunneling	Hauling	1	20	HHDT
Microtunneling	Onsite truck			HHDT
PIPS and ECWRF				
PIPS and ECWRF	Worker	23	11.7	LDA,LDT1,LDT2
PIPS and ECWRF	Vendor	10	8.4	HHDT,MHDT
PIPS and ECWRF	Hauling	0	20	HHDT
PIPS and ECWRF	Onsite truck			HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Tr	Miles per Tri	Vehicle Mix
Trenching				
Trenching	Worker	15	11.7	LDA,LDT1,LDT2
Trenching	Vendor		8.4	HHDT,MHDT
Trenching	Hauling	13	20	HHDT
Trenching	Onsite truck			HHDT
MT Shafts				
MT Shafts	Worker	8	11.7	LDA,LDT1,LDT2
MT Shafts	Vendor	2	8.4	HHDT,MHDT

MT Shafts	Hauling	2	20	HHDT
MT Shafts	Onsite truck			HHDT
Restoration				
Restoration	Worker	20	11.7	LDA,LDT1,LDT2
Restoration	Vendor		8.4	HHDT,MHDT
Restoration	Hauling	12	20	HHDT
Restoration	Onsite truck			HHDT
Microtunneling				
Microtunneling	Worker	3	11.7	LDA,LDT1,LDT2
Microtunneling	Vendor	1	8.4	HHDT,MHDT
Microtunneling	Hauling	1	20	HHDT
Microtunneling	Onsite truck			HHDT
PIPS and ECWRF				
PIPS and ECWRF	Worker	23	11.7	LDA,LDT1,LDT2
PIPS and ECWRF	Vendor	10	8.4	HHDT,MHDT
PIPS and ECWRF	Hauling	0	20	HHDT
PIPS and ECWRF	Onsite truck			HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction

5.5. Architectural Coatings

Phase Name	Residential Interior A	Residential	Non-Reside	Non-Resid	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (C	Material Exp	Acres Grade	Material D	Acres Paved (acres)
Trenching		27903	281	0	
MT Shafts		1681	0	0	
Restoration	26684		0	0	3.58

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Redu	PM2.5 Reduction

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Other Asphalt Surfaces	3.58	100

5.8. Construction Electricity Consumption and Emissions Factors

Year	kWh per Year	CO2	CH4	N2O
2025	0	204	0.03	< 0.005
2026	0	204	0.03	< 0.005

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity S	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity S	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Loc	Unit
Temperature and Extreme Heat	8.49	annual days of extreme heat
Extreme Precipitation	9.2	annual days with precipitation above 20 mm
Sea Level Rise	0	meters of inundation depth
Wildfire	16	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity S	Adaptive Ca	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A

Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity S	Adaptive Ca	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	
AQ-Ozone	11.6
AQ-PM	12
AQ-DPM	10.9
Drinking Water	36.9
Lead Risk Housing	6.77
Pesticides	67.5
Toxic Releases	32
Traffic	63.8
Effect Indicators	
CleanUp Sites	42.6
Groundwater	92.8
Haz Waste Facilities/Generators	78.4
Impaired Water Bodies	96.8
Solid Waste	98.1
Sensitive Population	
Asthma	27.8
Cardio-vascular	32.8
Low Birth Weights	21.1
Socioeconomic Factor Indicators	
Education	19.3
Housing	12.8
Linguistic	24.8
Poverty	22.5

Unemployment	29.4

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	
Above Poverty	93.76363403
Employed	86.15424099
Median HI	86.33388939
Education	
Bachelor's or higher	72.69344283
High school enrollment	100
Preschool enrollment	72.83459515
Transportation	
Auto Access	98.98626973
Active commuting	51.96971641
Social	
2-parent households	93.95611446
Voting	94.5078917
Neighborhood	
Alcohol availability	72.43680226
Park access	37.0075709
Retail density	7.853201591
Supermarket access	13.06300526
Tree canopy	62.26100346
Housing	
Homeownership	76.49172334
Housing habitability	95.52162197
Low-inc homeowner severe hous	83.45951495
Low-inc renter severe housing co	91.85166175
Uncrowded housing	87.19363531
Health Outcomes	
Insured adults	92.73707173
Arthritis	0
Asthma ER Admissions	58
High Blood Pressure	0
Cancer (excluding skin)	0
Asthma	0
Coronary Heart Disease	0
Chronic Obstructive Pulmonary D	0
Diagnosed Diabetes	0
Life Expectancy at Birth	65
Cognitively Disabled	40
Physically Disabled	82
Heart Attack ER Admissions	67
Mental Health Not Good	0
Chronic Kidney Disease	0
Obesity	0

Pedestrian Injuries	52
Physical Health Not Good	0
Stroke	0
Health Risk Behaviors	
Binge Drinking	0
Current Smoker	0
No Leisure Time for Physical Acti	0
Climate Change Exposures	
Wildfire Risk	0
SLR Inundation Area	36
Children	57
Elderly	28
English Speaking	83
Foreign-born	19
Outdoor Workers	82
Climate Change Adaptive Capacity	
Impervious Surface Cover	79
Traffic Density	51
Traffic Access	23
Other Indices	
Hardship	7.6
Other Decision Support	
2016 Voting	97

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Pro	25
Healthy Places Index Score for Pr	93
Project Located in a Designated D	No
Project Located in a Low-Income	No
Project Located in a Community A	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

Measure Title	Co-Benefits Achieved

7.5. Evaluation Scorecard

Category	Number of Applicabl	Total Points	Max Possibl	Weighted Score

7.6. Health & Equity Custom Measures

Measure Title	Sponsor

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phas	per construction schedule
Construction: Off-Road Equipme	per project description
Construction: Dust From Materia	per project description

Construction: Trips and VMT	per project description
Construction: Off-Road Equipmei	crushing/processing assumed same as tractor/loader/backhoe

APPENDIX B: ACQUATIC RESOURCES DELINEATION

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PIPS PARALLEL FORCE MAIN DESIGN PROJECT

Aquatic Resources Delineation Report

Prepared for
Woodard & Curran

October 2023

PIPS PARALLEL FORCE MAIN DESIGN PROJECT

Aquatic Resources Delineation Report

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Woodard & Curran

October 2023

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TABLE OF CONTENTS

PIPS Parallel Force Main Project
Aquatic Resources Delineation Report

Page

List of Tables

List of Figures

Acronyms and Other Abbreviations

1987 Manual	*1987 Corps of Engineers Wetland Delineation Manual*
Arid West Supplement	*Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0)
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CWA	Clean Water Act
EPA	U.S. Environmental Protection Agency
ESA	Environmental Science Associates
GIS	Geographic Information System
GPS	global positioning system
NRCS	U.S. Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	ordinary high-water mark
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
Rapanos	*Rapanos v. United States*, 547 U.S. 715 (2006)
Regional Water Board	Regional Water Quality Control Board
SF Bay	San Francisco Bay
TNW	Traditional Navigable Water
USACE	U.S. Army Corps of Engineers
Water Board	State Water Resources Control Board

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CHAPTER 1
Introduction

This report has been prepared to document the results and conclusions of an aquatic resources delineation and field survey conducted for the PIPS Parallel Force Main Project (Project). The City of Petaluma (City) owns and operates the Primary Influent Pump Station (PIPS), which collects a majority of the City's sewage flow and pumps it through a single 36-inch diameter force main to the Ellis Creek Water Recycling Facility (ECWRF). The 36-inch force main is approximately two and a half miles long and was constructed in 1973, at the same time as the construction of the PIPS facility. The existing force main is constructed entirely of concrete lined and coated rod reinforced steel cylinder pipe (concrete cylinder pipe).

The reliability of the force main is of upmost importance because it conveys nearly all the City's sewage to the ECWRF. Without redundancy or alternative conveyance options, taking the force main offline for any reason is extremely expensive and labor intensive. This issue came into focus in 2013 when Caltrans damaged the force main during construction of new support columns as part of a U.S. Highway 101 widening project. Caltrans proceeded to install a new 54-inch diameter welded steel casing under the railroad tracks approximately 20 feet south of the existing force main to support the future construction of a parallel force main. Coupled with the age of the existing pipeline, this damage highlighted the need for the City to plan, design, and construct a parallel force main.

Environmental Science Associates (ESA) biologists investigated the extent of aquatic resources that may be subject to regulation under the Clean Water Act (CWA) and state regulations, including the Porter-Cologne Water Quality Control Act (Porter-Cologne Act). The study area comprises the approximately 2.35-mile alignment (**Figure 1-1**). This report also provides background information necessary to support future permit applications for the Project under CWA sections 404 and 401 and the Porter-Cologne Act.

The aquatic resource delineation process involves determining the boundaries between wetlands, waters, and surrounding uplands by investigating the three parameters that define a wetland—vegetation, soils, and hydrology—and those parameters that define non-wetland waters (known as "other waters"). This delineation is based on the best professional judgment of the ESA investigators. All aquatic resources and their extent and boundaries as identified in this report are considered preliminary, pending verification from the U.S. Army Corps of Engineers (USACE).

1.1 Survey Location

The aquatic resources delineation study area for the Project is located in Petaluma, Sonoma County, California. The Project is on the Petaluma River, California, U.S. Geological Survey 7.5-minute series quadrangle. The approximate centroid of the study area is 38.231750°, -122.604151°.

1.1.1 Directions to the Study Area

Directions to the centroid of the study area from San Francisco are as follows:

- Take United States Route 101 north from San Francisco.
- Take exit 460A for CA-37 toward Napa/Vallejo
- Continue onto CA37 E
- Turn left onto Lakeville Hwy
- Turn left onto Casa Grande Rd
- Turn left onto Technology Ln, at the approximate centroid of the study area.

1.2 Contact Information

1.2.1 Applicant

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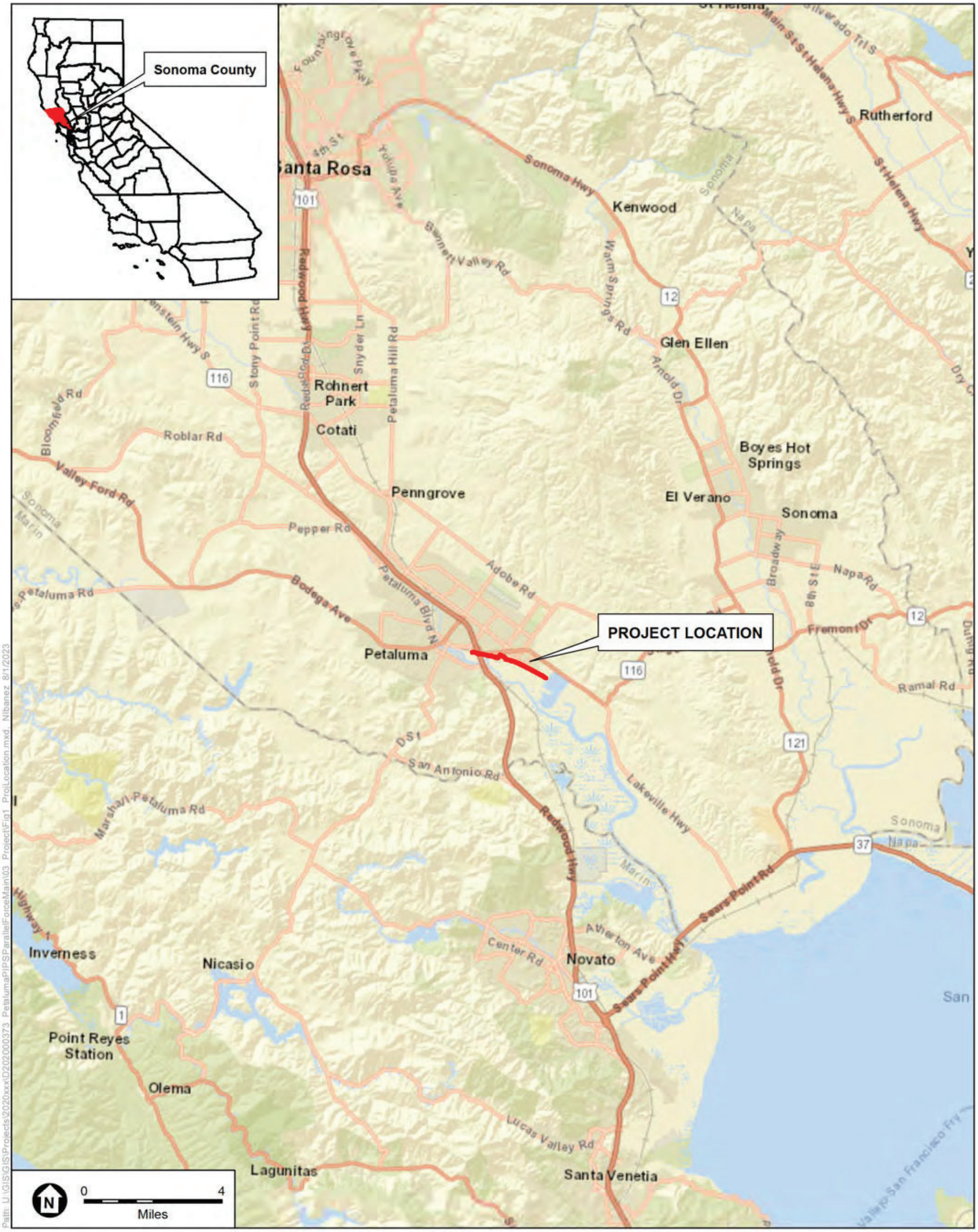

SOURCE: ESA, 2023; ESRI World Street Map.

Petaluma PIPS Parallel Force Main Project

Figure 1
Regional Location

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CHAPTER 2
Existing Conditions

2.1 Aquatic Resources Delineation Study Area

The study area is located in Sonoma County, California, in the city of Petaluma (**Figure 2-1**). Regionally, the study area is located in the northern San Francisco Bay Area, northwest of the San Francisco Bay (SF Bay) and in the San Francisco Bay Area subregion of the Central Western California region in the California Floristic Province (Baldwin et al., 2012). The study area is within the Northern California Coast ecological section (Miles and Goudey, 1997). This section contains mountains, hills, valleys, and plains in the northern California Coast Ranges. Summers in this region are foggy, with cooler temperatures and higher humidity than inland sections. Natural communities found here include redwood, Douglas-fir, tanoak, Oregon white oak, purple needlegrass, and coast live oak communities. The southern part of this section contains expanding urban areas.

The study area for this aquatic resources delineation encompasses the proposed pipeline alignment, pedestrian path, road crossing modifications, staging areas, and any other areas that could be affected by the Project. It includes a 75-ft buffer along the pipeline alignment and a 100-ft buffer around the pedestrian path. Land uses in and adjacent to the study area are characterized primarily by undeveloped areas, low- to high-density residential and commercial uses.

2.2 Vegetation

The project alignment is located mainly in developed/disturbed areas and non-native grassland. Developed/disturbed areas in the study area include unvegetated areas occupied by buildings, roads, parking lots, paved areas, and other developed facilities, as well as ornamental landscaping (e.g., tree groves, street strips, shade tree/lawn, lawn, and shrub cover) or heavily disturbed areas associated with commercial and residential development. The non-native grassland is dominated by annual, non-native grasses such as bromes (*Bromus* spp.), wild oat (*Avena* sp.), harding grass (*Phalaris aquatica*), and non-native forbs including mustards (*Brassica* spp., *Hirschfeldia incana*), wild radish (*Raphanus sativus*), fennel (*Foeniculum vulgare*), yellow star thistle (*Centaurea solstitialis*), and wild teasel (*Dipsacus fullonum*). The project alignment also includes a small area of aquatic habitat and riparian woodland. Mixed riparian woodland can be found near the perennial and intermittent streams and is characterized by an overstory of California bay laurel (*Umbellularia californica*), California live oak (*Quercus agrifolia),* willow (*Salix* spp.), valley oak (*Quercus lobata)* and big-leaf maple (*Acer macrophyllum*). The understory vegetation includes non-native grasses, and other, primarily non-native, plants including Himalayan blackberry, fennel (*Foeniculum vulgare*), Italian thistle (*Carduus pycnocephalus*), and English ivy (*Hedera helix*). Aquatic communities such as perennial and intermittent streams, emergent wetlands, and seasonal wetlands occur at a few places along the pipeline alignment and are described in further detail in the results section.

2.3 Soils

The U.S. Natural Resources Conservation Service (NRCS) Web Soil Survey was consulted to determine the soil units occurring within the delineation study area. The *Custom Soil Resource Report for Sonoma County, California* (NRCS, 2023a; included as **Appendix A**) shows five soil units occurring within the study area. Of those, four units contain major components that are listed by NRCS on the *National Hydric Soils List for Sonoma County, California* (NRCS, 2023b). The following list briefly describes each soil unit.

- **Reyes clay, 0 to 2 percent slopes**, has major components listed as hydric by NRCS (2023b). This soil unit occurs in tidal marshes and tidal flats with parent material derived from estuarine deposits. This is a somewhat poorly drained soil with a low to moderately-high water capacity. The map unit composition is 90 percent Reyes and similar soils, and 10 percent minor components such as Novato and Clear Lake soils.

- **Alluvial land, sandy,** has major components listed as hydric by NRCS (2023b). This soil unit occurs on floodplains with parent material derived from alluvium. The map unit composition is 85 percent alluvial land, and 15 percent unnamed minor components.

- **Clear lake clay loam, 0 to 2 percent slopes,** has major components listed as hydric by NRCS (2023b). This soil unit occurs on stream terraces with parent material derived from volcanic and sedimentary rock. This is a poorly drained soil with moderately low to moderately high water capacity. The map unit composition is 85 percent Clear lake and similar soils, 15 percent minor components which include 8 percent Wright soils and 7 percent Huichica soils.

- **Clear lake clay, sandy substratum, 0 to 2 percent slopes,** has major components listed as hydric by NRCS (2023b). This soil unit occurs on basin floors with parent material of basin alluvium derived from volcanic and sedimentary rock over fan alluvium derived from volcanic and sedimentary rock. This is poorly drained soil with moderately low to moderately high water capacity. This map unit composition is 85 percent Clear lake, sandy substratum and similar soils, 15 percent minor components which include 5 percent Wright soils, 5 percent Haire soils and 5 percent Reyes soils.

- **Gullied land,** does not have major components listed as hydric by NRCS (2023b). This soil unit occurs on hills and is well drained. This map unit composition is 85 percent Gullied land and 15 percent minor components which include two unnamed components.

Figure 2-1: Existing Force Main and Proposed Parallel Force Main Alignment Overview

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2.4 Hydrology

The study area is located in southeastern Petaluma, just north of the Petaluma River. The pipeline alignment is within the San Pablo Bay watershed. Small channels in this watershed receive water from precipitation and runoff from the surrounding developed areas, and flow toward the Petaluma River. Many of the natural creeks in this area have been artificially realigned to flow through and around developed urban and agricultural areas. These features eventually flow into Petaluma River, then to San Pablo Bay estuaries and eventually into the San Francisco Bay. The lower 20 miles of the Petaluma River, as well as any other waters subject to the ebb and flow of the tide are considered traditional navigable waters (TNWs). The pipeline alignment runs through the north end of Schollenberger Park, a City-owned property with emergent wetlands that is used as a dredge-spoils site, with a decanting channel to channel controlled removal of excess water to Adobe Creek. The pipeline ends on the east side at the Ellis Creek Water Recycling Facility, a sewage treatment plant with a series of polishing wetlands, seasonal wetlands, and brackish tidal wetlands.

2.5 Climate

The overall Northern California climate is characterized by warm, dry summers and cool, wet winters, with the bulk of precipitation occurring as rain in the winter months. Petaluma's climate is temperate with marine influence, with mean annual precipitation of 24.82 inches and mean annual temperatures ranging from a high of 70.7 degrees to a low of 45.6 degrees Fahrenheit (see **Table 4-1** and **Appendix B**) (AgACIS, 2023).

TABLE 4-1
MONTHLY TOTAL PRECIPITATION FOR PETALUMA AIRPORT, CALIFORNIA

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2013	0.6	0.44	0.8	1.15	0.21	0.56	0	0	0.61	0	0.87	0.38	5.62
2014	0.12	9.6	2.9	1.61	M0.00	0	0.02	0.05	0.42	0.59	3.25	15.6	34.16
2015	0.03	2.86	0.08	1.27	0.37	0.26	0.06	0	0.04	0.06	1.96	4.99	11.98
2016	6.96	0.88	6.63	1.05	0.31	0	0	0	0	5.56	3.09	3.92	28.4
2017	11.85	9.93	2.67	2.76	0	0.23	0	0	0.02	0	3.67	0.08	31.21
2018	4.8	0.15	5.24	4.55	0.35	0	0	0	0	1.34	4.19	2.42	23.04
2019	5.75	10.96	5.33	0.61	2.81	0	0	M0.00	0.05	0.02	M0.76	6.56	32.85
2020	2.55	0	2.15	1.07	M1.41	0	0	0.18	0	M0.00	M0.66	M1.67	9.69
2021	3.66	M0.90	1.73	0.05	0	0	0	0	0.09	M7.96	1.61	M5.91	21.91
2022	0.66	0.08	0.84	2.07	M0.00	0.42	0	0.03	1.02	0	1.53	8.29	14.94
2023	9.58	3.38	M8.52	0.3	0.8	M0.01	--	--	--	--	--	--	22.59
Mean	4.23	3.83	2.84	1.50	0.61	0.15	0.01	0.03	0.23	0.95	2.52	5.28	21.49

NOTE:
T = trace amounts of precipitation
M = missing; used when more than one day of data is missing for a month.

SOURCE: AgACIS, 2023.

The field investigation for this aquatic resources delineation was conducted on June 15, 2023. According to the National Oceanic and Atmospheric Administration, 0.0 inches of rain had fallen in the study area in the seven days before the survey dates (AgACIS, 2023). From October of 2022 to April of 2023 the area received 134% of the average precipitation for this area.

CHAPTER 3
Regulatory Framework

3.1 Waters of the U.S.

3.1.1 Rivers and Harbors Act of 1899

Section 10 of the Rivers and Harbors Act (RHA) (33 U.S.C. § 403) requires authorization from the Corps for work or structures in or affecting navigable waters of the U.S. The term "navigable waters of the U. S." generally includes those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity (33 C.F.R. §329.4).

Section 14 of the RHA of 1899 (33 U.S.C. § 408), commonly referred to as "Section 408," authorizes the Corps to grant permission to alter, occupy, or use a Corps civil works project if the Secretary determines that the activity will not be injurious to the public interest and will not impair the usefulness of the project.

3.1.2 Clean Water Act

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but the Act was significantly reorganized and expanded in 1972. "Clean Water Act" became the Act's common name with amendments in 1972.

Section 404 of the CWA establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports) and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404 regulation (e.g., certain farming and forestry activities).

Wetlands are defined by USACE as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." (33 CFR §328.3[c][1]; 40 CFR §120.2[c][1]). Indicators of three wetland parameters (i.e., hydric soils, hydrophytic vegetation, and wetlands hydrology), as determined by site investigation, must be present for a site to be classified as a wetland by USACE (Environmental Laboratory 1987).

Section 401 of the CWA gives the state authority to grant, deny, or waive certification of proposed federally licensed or permitted activities resulting in discharge to waters of the U.S. The State Water Resources Control Board (State Water Board) directly regulates multi-regional projects and supports the Section 401 certification and wetlands program statewide. The Regional Water Quality Control Board (RWQCB) regulates activities pursuant to Section 401(a)(1) of the federal CWA, which specifies that certification from the State is required for any applicant requesting a federal license or permit to conduct any activity including but not limited to the construction or operation of facilities that may result in any discharge into navigable waters. The certification shall originate from the State or appropriate interstate water pollution control agency in/where the discharge originates or will originate. Any such discharge will comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the CWA.

3.1.3 Waters of the U.S.

Since its inception, the definition of the Waters of the U.S. has been a litigious issue. Most recently, the Supreme Court, ruling in *Sackett v. Environmental Protection Agency*, sharply limited the scope of the federal Clean Water Act's protection for the nation's waters. As a result of this decision, on August 29, 2023, the U.S. Environmental Protection Agency (EPA) and the USACE issued a final rule that amends the "Revised Definition of 'Waters of the United States'" to conform key aspects of the regulatory text to the U.S Supreme Court's decision.

Under the amended Revised Definition of "Waters of the United States," the term "waters of the United States" was defined as follows (33 CFR 328.3(a)):

(1) Waters which are:

(i) Currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(ii) The territorial seas; or

(iii) Interstate waters;

(2) Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph (a)(5) of this section; To meet this category, you must be able to demonstrate that the current impoundment would have met the criteria of a water of the U.S. at the time of impoundment. Meaning that prior to the impoundment the feature would have met a(1), a(3), a(4) or a(5). This usually requires using historic aerial photos/maps or historic topo maps.

(3) Tributaries of waters identified in paragraph (a)(1) or (2) of this section that are relatively permanent, standing or continuously flowing bodies of water;

(4) Wetlands adjacent to the following waters:

  (i) Waters identified in paragraph (a)(1) of this section; or

  (ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters;

(5) Intrastate lakes and ponds not identified in paragraphs (a)(1) through (4) of this section that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (a)(1) or (a)(3) of this section.

In addition, the amended regulations include eight types of excluded waters (33 CFR 328.3(b)) which are not ‘‘waters of the United States’’ even where they otherwise meet the terms of paragraphs (a)(2) through (5) of this section:

(1) Waste treatment systems, including treatment ponds or lagoons, designed to meet the requirements of the Clean Water Act;

(2) Prior converted cropland designated by the Secretary of Agriculture. The exclusion would cease upon a change of use, which means that the area is no longer available for the production of agricultural commodities. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA;

(3) Ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water;

(4) Artificially irrigated areas that would revert to dry land if the irrigation ceased;

(5) Artificial lakes or ponds created by excavating or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing;

(6) Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating or diking dry land to retain water for primarily aesthetic reasons;

(7) Waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States; and

(8) Swales and erosional features (e.g., gullies, small washes) characterized by low volume, infrequent, or short duration flow.

3.2 Waters of the State

3.2.1 Porter-Cologne Water Quality Control Act of 1969

Most projects involving water bodies or drainages are regulated by the regional water board, the principal state agency overseeing water quality of the state at the local/regional level. The survey area is located within the region of the San Francisco Bay Regional Water Board. Regional water boards are responsible for implementing Section 401 of the CWA as described above.

In the absence of waters of the United States, waters may be regulated under the Porter-Cologne Act if project activities, discharges, or proposed activities or discharges could affect California's surface, coastal, or ground waters. The permit submitted by the applicant and issued by the regional water board is either a water quality certification in the presence of waters of the United States or a waste discharge requirement in the absence of waters of the United States.

The State Wetland Definition and Procedures, as prepared by the State Water Board, was adopted April 2, 2019, and revised April 6, 2021. The State Wetland Definition and Procedures includes a definition for wetland waters of the state and exclusions for certain artificial wetlands, as listed below.

Section 13050 of the California Water Code defines *waters of the state* broadly to include “any surface water or groundwater, including saline waters, within the boundaries of the state.” Waters of the state include all waters of the United States. The following wetlands are waters of the state:

1. Natural wetlands,
2. Wetlands created by modification of a surface water of the state, and
3. Artificial wetlands that meet any of the following criteria:
    a. Approved by an agency as compensatory mitigation for impacts to other waters of the state, except where the approving agency explicitly identifies the mitigation as being of limited duration;
    b. Specifically identified in a water quality control plan as a wetland or other water of the state;
    c. Resulted from historic human activity, is not subject to ongoing operation and maintenance, and has become a relatively permanent part of the natural landscape; or
    d. Greater than or equal to one acre in size, unless the artificial wetland was constructed, and is currently used and maintained, primarily for one or more of the following purposes (i.e., the following artificial wetlands are not waters of the state unless they also satisfy the criteria set forth in 2, 3a, or 3b):
        i. Industrial or municipal wastewater treatment or disposal,
        ii. Settling of sediment,
        iii. Detention, retention, infiltration, or treatment of stormwater runoff and other pollutants or runoff subject to regulation under a municipal, construction, or industrial stormwater permitting program,

iv. Treatment of surface waters,

v. Agricultural crop irrigation or stock watering

vi. Fire suppression,

vii. Industrial processing or cooling,

viii. Active surface mining—even if the site is managed for interim wetlands functions and values,

ix. Log storage,

x. Treatment, storage, or distribution of recycled water, or

xi. Maximizing groundwater recharge (this does not include wetlands that have incidental groundwater recharge benefits); or

xii. Fields flooded for rice growing.

3.3 Rivers, Streams, and Lakes

Pursuant to Division 2, Chapter 6, Section 1600 et seq. of the FGC, California Department of Fish and Wildlife (CDFW) regulates all diversions, obstructions, or changes to the natural flow or bed, channel or bank of any river, stream, or lake which supports fish or wildlife. A notification of a Lake or Streambed Alteration must be submitted to CDFW for “any activity that may substantially change the bed, channel, or bank of any river, stream, or lake.” In addition, CDFW has authority under FGC over wetland and riparian habitats associated with lakes and streams. The CDFW reviews proposed actions, and if necessary, submits to the applicant a proposal that includes measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by CDFW and the applicant is the Lake or Streambed Alteration Agreement (LSAA).

Fish and Game Code Section 2785 defines riparian habitat as “lands which contain habitat which grows close to and depends upon soil moisture from a nearby freshwater source.” Additionally, the CDFW Notification Instructions and Process guide characterizes the riparian zone as “the area that surrounds a channel or lake and supports (or can support) vegetation that is dependent on surface or subsurface flow.” Furthermore, this CDFW guide calls for the analysis of impacts to the riparian zone up to the outer landward edge of the drip line of riparian vegetation.

CHAPTER 4
Methodology

4.1 Pre-field Review

The following information sources have been reviewed before conducting the field investigation:

- The Petaluma River, California U.S. Geological Survey 7.5-minute topographic quadrangle maps (both historic and current quadrangles were reviewed).
- Google Earth aerial photographs of the study area for vegetative, topographic, and hydrographic signatures (Google Earth, 2023) (historic aerial photographs were reviewed along with current 2022 aerial photographs).
- The *Custom Soil Resource Report for Sonoma County, California* (NRCS, 2023a), for information about soils and geomorphology.
- The *National Hydric Soils List for Sonoma County, California,* (NRCS, 2023b), to determine whether any soils mapped within the study area are considered hydric at the level of soil series.
- The National Wetlands Inventory (NWI) (USFWS, 2023).
- The Arid West Regional Wetland Plant List (USACE, 2020).

4.2 Field Survey Methods

4.2.1 Waters of the U.S. and State

The aquatic resources delineation was conducted by ESA wetland ecologist Nicole Ibañez and ESA biologist Liza Ryan on June 15, 2023. Before the field surveys, the biologists analyzed aerial photography to locate potential features using wetland and drainage signatures, as described in the following *Remote Sensing* subsection. Areas within the delineation study area that showed evidence of wetland and/or drainage signatures were investigated. During the investigation, the biologists surveyed the entire study area, investigating all potential waters of the U.S. and/or waters of the state.

The delineation used the “Routine Determination Method” as described in the *1987 Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987), hereafter referred to as the “1987 Manual.” The 1987 Manual was used in conjunction with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE, 2008), hereafter referred to as the “Arid West Supplement.” For areas where the 1987

Manual and the Arid West Supplement differ, the Arid West Supplement was followed. In addition, *A Guide to Ordinary High Water Mark (OHWM) Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the Western United States* (USACE, 2014) was referenced to assist in identifying the OHWM and the lateral limits of the stream channels in the study area.

Remote Sensing

Before the field surveys, potential aquatic resources were identified via remote sensing. The desktop analysis relied on the interpretation of aerial photography and other existing data. During the analysis, information and signatures of aquatic resources were identified on aerial photographs. Information and wetland signatures used during this analysis included:

- NWI—the area is mapped as a wetland/water on the U.S. Fish and Wildlife Service NWI (USFWS, 2023).
- Signatures of hydrophytic vegetation (observed as different color than surrounding vegetation).
- Signatures of inundation and/or soil saturation.
- Signatures of topographic depressions or channelization.

These potential aquatic resources identified in the desktop analysis were then visited in the field to be investigated further.

Wetlands

Three positive parameters must normally be present for an area to be considered a wetland: dominance of wetland vegetation, presence of hydric soils, and presence of wetland hydrology. The presence or absence of positive indicators for wetland vegetation, soils, and hydrology was assessed in accordance with the 1987 Manual and Arid West Supplement. Data were collected at data points within the study area. In accordance with USACE guidance, data points were taken at sites representative of the vegetation, hydrology, and physical characteristics across the various wetland types and at adjacent upland areas. Results were extrapolated to nearby wetlands exhibiting similar vegetation and hydrologic conditions. Data points were recorded on Arid West wetland determination data forms, which are provided as **Appendix C**.

At each data point, a visual assessment of the dominant plant species was made within a 3-foot radius. Dominant species were assessed using the recommended “50/20” rule per the Arid West Supplement. Plants were identified to species using *The Jepson Manual: Vascular Plants of California (Second Edition)* (Baldwin et al., 2012). The *National Wetland Plant List: 2020 Wetland Ratings* (Lichvar et. al, 2020) was used to determine the wetland indicator status of all plants. All species noted within the study plots were recorded on the data sheets.

Soils were characterized at each data point by color, texture, organic matter accumulation, and the presence or absence of hydric soil indicators. Color was described using the *Munsell Soil Color Book* (Munsell Color, 2015). Soils were also inspected for redoximorphic features and soil texture was determined. It was then possible to determine whether the soils met the definitions of any of the hydric soil indicators described in the Arid West Supplement and listed on the Arid West data sheets.

The presence of wetland hydrology was determined at each data point by documenting the presence or absence of primary and/or secondary wetland hydrology indicators, according to the Arid West Supplement.

Non-Wetland (Other) Waters of the U.S.

Non-wetland waters of the U.S. extend to the OHWM, defined in 33 CFR 328.3 as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, or the presence of litter and debris. Drainages with an OHWM were characterized by noting vegetation, geomorphology (e.g., incision), and hydrologic characteristics, and by measuring representative channel bank cross sections to obtain the OHWM. Representative channel cross section OHWMs were recorded in the field and used to map streams with Geographic Information System (GIS) software, along with high-resolution aerial photographs and detailed topographic data. For stream segments that were culverted, the width of the culvert was measured or estimated to determine the OHWM.

4.2.2 Mapping and Acreage Calculations

All accessible features including wetland data points, wetland boundaries, OHWM intervals, and stream channel courses were recorded using a global positioning system (GPS) with sub-meter accuracy (EOS Arrow 100 GNSS receiver with ESRI’s ArcGIS Collector application). In the office, GPS data were downloaded and aquatic features mapped using GIS software (ArcGIS 10.6.1) on an overlay of both topography and geo-referenced aerial photography. GPS-determined wetland boundaries and data points were visually confirmed. The acreages of aquatic resource polygons and length of linear features were determined using ArcGIS.

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CHAPTER 5
Results

5.1 Aquatic Resources

The aquatic resources delineation identified approximately 4.517 acres of aquatic resources in the study area. Aquatic habitats in the study area were classified using the *Classification of Wetlands and Deepwater Habitats of the United States* (FGDC, 2013) ("Cowardin Classification"). A summary of aquatic resources in the study area by type is in Table 5-1 and described in this section. Representative photographs of the aquatic resources and data points are in **Appendix D**. A table of individual aquatic resources is in **Appendix E**. Supporting information, such as a soils report, a rainfall summary, Arid West data sheets, representative photographs for the delineation study area, and the OMBIL Regulatory Module data sheet are in Appendices A through E. **Appendix F** is the Aquatic Resource Delineation Map which shows the locations and extent of the aquatic resources in the study area.

TABLE 5-1
AQUATIC RESOURCES SUMMARY

Aquatic Feature	Cowardin Classification	Acres	Square Feet	Linear Feet
Wetlands				
Fresh emergent wetland (3 features)	*Palustrine, Emergent, Persistent, Semipermanently Flooded* (PEM1F)	1.078	46,946	--
Saline emergent wetland (4 features)	*Estuarine, Intertidal, Emergent, Persistent,* (E2EM1)	0.680	29,616	--
Seasonal wetland (7 features)	*Palustrine, Emergent, Persistent, Seasonally Flooded* (PEM1C)	0.670	29,184	--
	Total Wetlands	**2.428**	105,745	**--**
Other Waters				
Ditch (1 feature)	*Riverine, Ephemeral* (R6)	0.011	459	240
Ephemeral channel (1 feature)	*Riverine, Ephemeral* (R6)	0.053	2,308	375
Intermittent channels (4 features)	*Riverine, Intermittent, Streambed, Seasonally Flooded* (R4SBC)	0.617	26,893	1,840
Perennial channel (3 features)	*Estuarine, Subtidal, Unconsolidated Bottom* (E1UB)	0.251	10,955	1,635
Perennial pond (3 feature)	*Palustrine, Unconsolidated Bottom, Permanently Flooded* (PUBH)	0.519	22,614	--
Seasonal pond (1 feature)	*Palustrine, Unconsolidated Bottom, Seasonally Flooded* (PUBC)	0.638	27,776	--
	Total Other Waters	**2.089**	91,004	**4,090**
	Total Aquatic Resources	**4.517**	196,749	**4,090**

SOURCES: FGDC 2013; data compiled by Environmental Science Associates in 2023.

5.1.1 Waters

Ephemeral Channel and Ditch

An *ephemeral channel* has flowing water during or immediately after a precipitation event. Two ephemeral channels were identified in the study area (Appendix F-1 and F-5). One ephemeral channel occurs in a ditch along the toe of the railroad track embankment. It is a small channel of dirt and gravel that carries runoff from the railroad and precipitation during rain events. A small, natural ephemeral channel connects the Seasonal Pond to Seasonal Wetland 7 (these features are described below). The OHWM is marked by a change in the vegetation community and a break in the slope. The ephemeral channel is classified as *Riverine, Ephemeral* (FGDC, 2013).

Intermittent Channel

An *intermittent channel* has flowing water during certain times of the year, when precipitation or groundwater provides water for channel flow. During dry periods, intermittent channels may not have flowing water. In the study area, intermittent channels generally flow throughout the winter season and into the late spring or early summer. Four intermittent channels were identified in the study area (Appendix F-1–4). Intermittent Channels 1 and 2 are channelized drainages that capture water from surrounding upland, paved surfaces, and only flow seasonally. Adobe Creek is a larger intermittent channel with a mature riparian corridor, that flows south through the eastern side of Petaluma, and eventually into the Petaluma River, just south of the study area. Intermittent Channel 3 is a decanting channel that receives controlled releases from the wetlands of Schollenberger Park and carries them to Adobe Creek. The western end of Intermittent Channel 3 is abutted by a dense freshwater wetland marsh. The OHWM of these intermittent channels are marked by areas of shelving and scour, a break in the slope, and a change in the plant community. Within the study area, these channels are classified as *Riverine, Intermittent, Streambed, Seasonally Flooded* (FGDC, 2013).

Perennial Channel

A *perennial channel* is a channel, or channel portion, that flows throughout the year. Three perennial channels were identified in the study area (Appendix F-1 and F-2). McDowell Creek is a large, tidal tributary to Petaluma River, just west of the Marina. Perennial Channels 1 and 2 are small, unnamed tidal channels that carry water through a wetland complex just north of Petaluma River. All three of these channels experience daily tidal fluctuations due to their proximity to San Pablo Bay and are connected to Petaluma River. These features contain a bed of mud and are directly bordered by saline emergent wetland, dominated by pickleweed (*Salicornia pacifica*). In these features, OHWM is characterized and steep, scoured banks, sedimentation, a break in the slope, and a change in the plant community. Within the study area, these features are classified as *Estuarine, Subtidal, Unconsolidated Bottom* (FGDC, 2013).

Ponds

Three perennial ponds and one seasonal pond occur in the eastern portion of the study area (Appendix F-5). These features are part of the Ellis Creek Water Recycling Facility. The ponds have been excavated to help filter and treat wastewater. The three perennial ponds are bordered by dense stands of California bulrush (*Schoenoplectus californicus*). These ponds contain gated culvert drains to allow for controlled movement of water. These features are classified as *Palustrine, Unconsolidated Bottom, Permanently Flooded,* (FGDC, 2013).

The seasonal pond was dry at the time of the June 2023 survey and was sparsely vegetated with hyssop loosestrife (*Lythrum hyssopifolia*), and brass buttons (*Cotula coronopifolia*). The seasonal pond is connected via a culvert to a channel to the south that drains to the Petaluma River. This feature is classified as *Palustrine, Unconsolidated Bottom, Seasonally Flooded,* (FGDC, 2013).

5.1.2 Wetlands

Freshwater Emergent Wetland

Freshwater emergent wetlands occur along the decanting channel and near the wastewater treatment ponds on the east side of the pipeline alignment (Appendix F-4 and F-5). FEW-1 occurs in between the decanting channel (IC-3) and adjacent upland developed areas. This wetland is dominated by dense cattails and tules, and likely holds water most of the year. FEW-2 and 3 are freshwater wetland swales that are connected via culvert to the seasonal pond associated with the wastewater treatment facility. They likely drain excess water from the pond toward the Petaluma River and its associated wetlands. These freshwater emergent wetlands are densely vegetated with hardstem bulrush (*Schoenoplectus acutus*), cattail (*Typha* sp.), and panicled bulrush (*Scirpus microcarpus*).

Soil saturation, and in some cases surface water was observed within these features during the field surveys and was the primary indicator of wetland hydrology in these wetlands (Indicator A3 and A1 from the Arid West Supplement). Hydric soils were indicated in these features by the presence of redox dark surface (Indicator F6[1] from the Arid West Supplement). These features in the study area are classified as *Palustrine, Emergent, Persistent, Semipermanently Flooded* (FGDC, 2013).

Saline Emergent Wetland

Saline emergent wetlands occur adjacent to both sides of the perennial, tidal waters on the west side of the study area (Appendix F-1 and F-2). SEW-1 and 2 line either side of McDowell Creek; SEW-3 borders PC-3 and SEW-4 borders PC-2. The saline emergent wetlands are dominated by pickleweed (*Salicornia pacifica*), saltgrass (*Distichlis spicata*), curly dock (*Rumex crispus*), Italian rye grass (*Festuca perennis*), and fat hen (*Atriplex prostrata*).

Soil saturation, drift deposits, and biotic crust were observed within these features during the field surveys and were the primary indicators of wetland hydrology in these wetlands (Indicator A3, B3, and B12). Hydric soils were indicated in these features by the presence of a depleted matrix (Indicator F3). Data point 1 reflects the conditions observed in the saline emergent wetlands during the field investigation and the surrounding upland areas are represented by data point 2. These

[1] Hydric soil indicators are presented in three groups in the Arid West Supplement. Group A: Indicators for All Soils. Group F: Indicators for Loamy and Clayey Soils. Group S: Indicators for Sandy Soils.

features in the study area are classified as *Estuarine, Intertidal, Emergent, Persistent* (FGDC, 2013).

Seasonal Wetland

Seasonal wetlands occur where water ponds for long enough to support hydrophytic vegetation in swales and depressions throughout the study area (Appendix F-1, F-2, and F-5). SW-1, 2 and 3 occur south of the railroad, and receive runoff from the ephemeral ditch at the toe of the railroad track embankment. SW-4 and 5 occur in swales within annual grassland south of developed areas, and likely receive water from precipitation and runoff from paved, developed areas nearby. SW-6 occurs in a depression southwest of the wastewater treatment ponds. It likely receives water from precipitation, runoff from the nearby upland trail, and potentially overflow from FEW-2. SW-7 occurs in a large depression south of the wastewater treatment ponds and is connected by an ephemeral channel to the seasonal pond. It likely received water from precipitation and overflow from the seasonal pond. These wetlands are dominated by hydrophytic vegetation such as fat-hen (*Atriplex prostrata*), cocklebur (*Xanthium strumarium*), nutsedge (*Cyperus eragrostis*), bristly ox tongue (*Helminthotheca echioides*), italian rye grass and annual beard grass (*Polypogon monspeliensis*). These features have hydric soil indicated by a depleted matrix (F3 indicator). The seasonal wetlands contain drift deposits (B3), surface soil cracks (B6), and biotic crust (B12), indicating wetland hydrology. Data points 4 and 5 reflect the conditions observed in the seasonal wetlands during the field investigation and the surrounding upland areas are represented by data point 3 (Appendix F). These features are classified as *Palustrine, Emergent, Persistent, Seasonally Flooded* (FGDC, 2013).

5.2 Analysis of Waters of the U.S.

The aquatic resources identified in the study area may potentially qualify as waters of the U.S. Only the USACE can make an official determination regarding the federal jurisdiction of the aquatic resources.

All the perennial channels in the study area are subject to the ebb and flow of the tide and are therefore likely to be considered waters of the U.S. pursuant to 33 CFR 328.3(a)(1). All the intermittent channels in the study area are relatively permanent tributaries that flow to a downstream TNW, Petaluma River, and are therefore also likely to be considered waters of the U.S. pursuant to 33 CFR 328.3(a)(5).

The ephemeral channels are non-relatively permanent waters and are therefore likely to not be considered waters of the U.S. by the USACE.

The saline emergent wetlands are adjacent to TNWs, and are therefore likely to be considered waters of the U.S. The freshwater wetlands are directly abutting RPWs or TNWs and are therefore likely to be considered waters of the U.S.

The perennial ponds in the study area are artificially constructed for use in wastewater treatment, and do not share surface water connection with any TNWs, therefore they are likely to not be considered waters of the U.S. by the USACE.

The seasonal pond and seasonal wetlands do not share a continuous surface water connection with any TNWs, and based on the 2023 Sackett v. EPA Supreme Court decision, are likely to not be considered waters of the U.S.

There are several areas of riparian woodland in the study area. These areas occur on the banks of intermittent and perennial channels. The proximity to persistent or intermittent water does support some hydrophytic vegetation. However, the banks are sloped such that water does not pond in these areas long enough to create ponding or saturated soils within 12 inches of the soil surface at a sufficient duration and frequency to support wetland hydrology or hydric soils. These areas do not meet the three-parameter test for wetlands and do not qualify as potential waters of the U.S.

5.3 Analysis of Waters of the State

"Waters of the state" include all waters of the U.S. identified in the section above. In addition, seasonal wetlands 1-6 would also be considered waters of the state, as they are naturally occurring or modified waters within the boundaries of the state. The perennial and seasonal ponds, ephemeral channel and SW-7 are specifically excluded from the definition of waters of the state because they are artificial wetlands constructed for municipal wastewater treatment. The ditch is also not a waters of the state because it is excavated in uplands and used for draining runoff from uplands.

5.4 Potentially Jurisdictional Section 10 Navigable Waters

Section 10 navigable waters can include all areas that could be, or have been, navigable. In the study area, this includes tidal channels, and tidal wetlands that are subject to the ebb and flow of tide below the mean high-water mark. Specifically, this includes McDowell Creek, PC-1 and 2, and SEW 1—4.

5.5 CFGC Section 1602 Lakes and Streambed Alteration Agreements

CDFW typically regulates activities that may affect streambeds and associated wetlands or riparian vegetation according to California Fish and Game Code Section 1602. In the study area, riparian vegetation was mapped to the outer edge of the overhanging riparian vegetation for the drainages. Therefore, activities that affect the riparian woodland in the study area could trigger CDFW notification requirements.

5.6 Conclusions

A total of 4.517 acres and 4,090 linear feet of aquatic resources were mapped in the study area. These include:

- 2.428 acre of wetlands; and
- 2.089 acres (4,090 linear feet) of other waters of the U.S.

Approximately 2.626 acres of aquatic resources may meet the criteria for waters of the U.S. Approximately 2.718 acres of aquatic resources may meet the criteria for waters of the state. Approximately 0.931 acre of aquatic resources may meet the criteria for Section 10 navigable waters.

In addition, activities that may affect a total of 0.27 acres of riparian woodland meet notification requirements for regulation under a CDFW section 1602 Lake or Streambed Alteration Agreement.

This report documents the aquatic resources boundary delineation and reflects the best professional judgment of the ESA investigators. All conclusions presented should be considered preliminary and subject to change pending official review and preliminary or approved jurisdictional determination in writing by USACE.

CHAPTER 6
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Appendix A
Soils Report

United States Department of Agriculture

NRCS

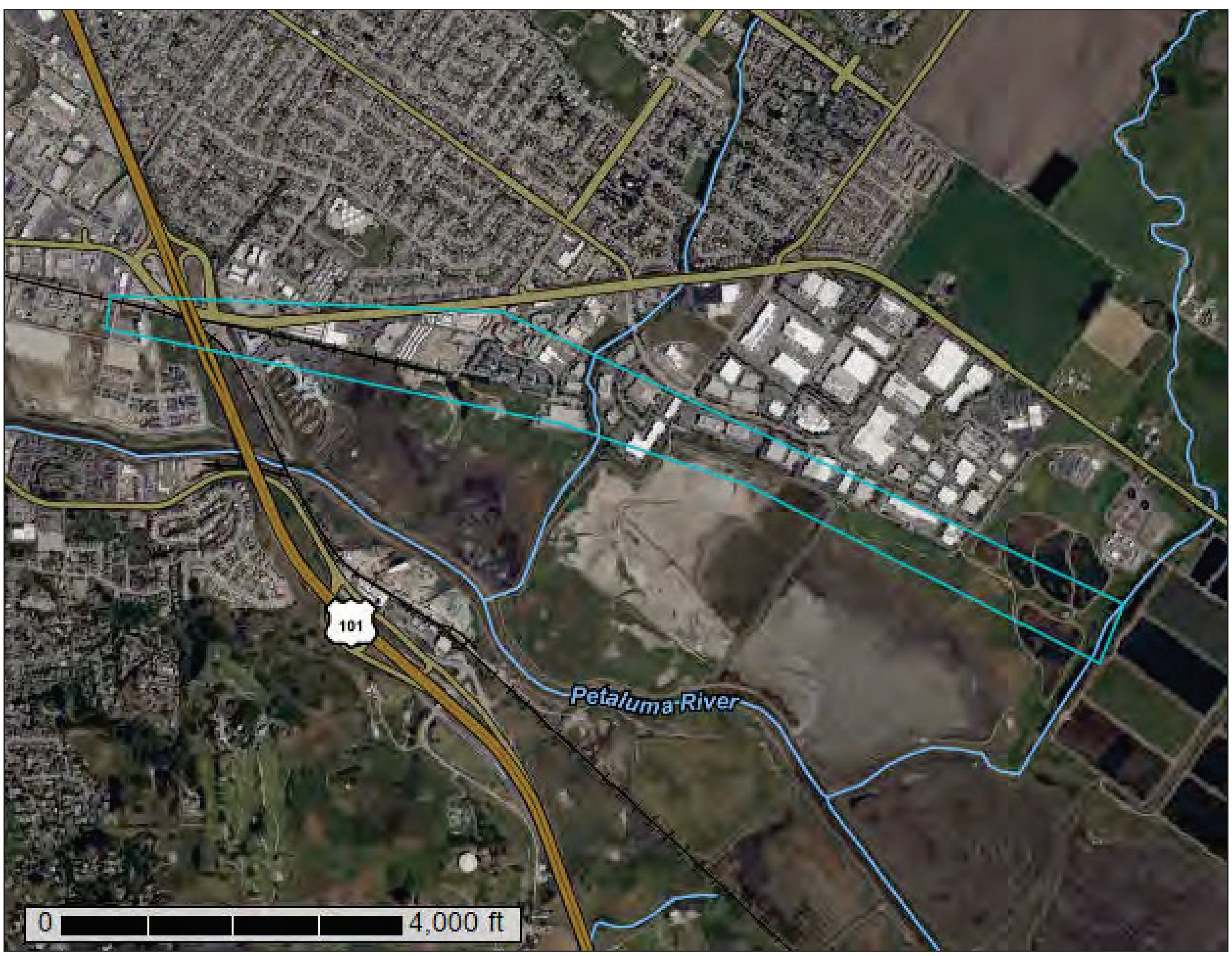
Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Sonoma County, California

PIPS Parallel Force Main Project



June 26, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map


122° 37' 31" W
122° 34' 32" W
38° 14' 26" N
38° 12' 54" N
533000
533400
533800
534200
534600
535000
535400
535800
536200
536600
537000
4232400
4232000
4231600
4231200
4230800
4230400
4230000
AdA
W
W
301
CeA
301
301
CcA
GuF
Mcdowell
Frates
Ely Rd S
Cader Ln
116
Petaluma
101
Petaluma River
Map Scale: 1:19,900 if printed on A landscape (11" x 8.5") sheet.
Meters
0 250 500 1000 1500
Feet
0 500 1000 2000 3000
N
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 16, Sep 14, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 26, 2022—Apr 25, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
301	Reyes clay, 0 to 2 percent slopes	61.0	28.4%
AdA	Alluvial land, sandy	6.7	3.1%
CcA	Clear Lake clay loam, 0 to 2 percent slopes	3.5	1.6%
CeA	Clear Lake clay, sandy substratum, 0 to 2 percent slopes	142.2	66.2%
GuF	Gullied land	0.9	0.4%
W	Water	0.6	0.3%
Totals for Area of Interest		**214.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Sonoma County, California

301—Reyes clay, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2yrgm
Elevation: 0 to 20 feet
Mean annual precipitation: 23 to 31 inches
Mean annual air temperature: 58 to 58 degrees F
Frost-free period: 319 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Reyes and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Reyes

Setting

Landform: Tidal marshes, tidal flats
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Estuarine deposits

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Ag - 1 to 15 inches: clay
Bjg - 15 to 55 inches: clay
2Cg - 55 to 79 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 6 to 20 inches to sulfuric
Drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 48 to 60 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Moderately saline to strongly saline (8.0 to 24.0 mmhos/cm)
Sodium adsorption ratio, maximum: 22.0
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C
Ecological site: R014XC007CA - ACID SUBIRRIGATED
Hydric soil rating: Yes

Minor Components

Novato

Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Reyes, overwashed

Percent of map unit: 2 percent
Landform: Tidal flats, tidal marshes
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Water

Percent of map unit: 1 percent

Typic xerorthents, levees

Percent of map unit: 1 percent
Landform: Tidal marshes
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Clear lake

Percent of map unit: 1 percent
Landform: Drainageways
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

AdA—Alluvial land, sandy

Map Unit Setting

National map unit symbol: hf9s
Elevation: 200 to 800 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 200 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Alluvial land: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alluvial Land

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

H1 - 0 to 10 inches: gravelly sand
H2 - 10 to 60 inches: stratified very gravelly coarse sand to sand

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydric soil rating: Yes

Minor Components

Unnamed

Percent of map unit: 15 percent
Hydric soil rating: No

CcA—Clear Lake clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2y8vc
Elevation: 10 to 320 feet
Mean annual precipitation: 27 to 41 inches
Mean annual air temperature: 57 to 59 degrees F
Frost-free period: 265 to 354 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Clear lake and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Clear Lake

Setting

Landform: Basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Alluvium derived from volcanic and sedimentary rock

Typical profile

Apg - 0 to 8 inches: clay loam

Assg - 8 to 25 inches: clay
Bssg - 25 to 46 inches: clay
Bkssg - 46 to 52 inches: clay
2Bkg - 52 to 60 inches: clay loam
2Btg - 60 to 72 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 7 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: C/D
Ecological site: R014XG907CA - Loamy Bottom
Hydric soil rating: Yes

Minor Components

Wright

Percent of map unit: 8 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Huichica

Percent of map unit: 7 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

CeA—Clear Lake clay, sandy substratum, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2vbsl
Elevation: 20 to 200 feet

Mean annual precipitation: 26 to 33 inches
Mean annual air temperature: 58 to 58 degrees F
Frost-free period: 290 to 320 days
Farmland classification: Prime farmland if irrigated and drained

Map Unit Composition

Clear lake, sandy substratum, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Clear Lake, Sandy Substratum

Setting

Landform: Basin floors
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Basin alluvium derived from volcanic and sedimentary rock over fan alluvium derived from volcanic and sedimentary rock

Typical profile

Apg1 - 0 to 2 inches: clay
Apg2 - 2 to 8 inches: clay
Assg - 8 to 25 inches: clay
Bssg1 - 25 to 39 inches: clay
Bssg2 - 39 to 46 inches: clay
Bkssg - 46 to 52 inches: clay
2Bkg - 52 to 60 inches: clay loam
2Btg - 60 to 72 inches: fine sandy loam
2C - 72 to 84 inches: stratified loamy coarse sand to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 6 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 8.0
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: R014XG905CA - Clayey Bottom
Hydric soil rating: Yes

Minor Components

Wright

Percent of map unit: 5 percent

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Haire
Percent of map unit: 5 percent
Landform: Basin floors
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Reyes
Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

GuF—Gullied land

Map Unit Composition
Gullied land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gullied Land

Setting
Landform: Hills

Typical profile
H1 - 0 to 60 inches: variable

Properties and qualities
Slope: 2 to 15 percent
Drainage class: Well drained
Runoff class: Very high
Frequency of flooding: FrequentNone
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 13 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 2 percent
Landform: Drainageways
Hydric soil rating: Yes

W—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

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Appendix B
WETS Table

WETS Table

WETS Station: PETALUMA AIRPORT, CA								
Requested years: 1971 - 2023								
Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	57.7	38.4	48.0	4.77	1.90	5.78	8	0.0
Feb	62.0	40.1	51.0	4.57	1.81	5.46	7	0.0
Mar	64.7	42.0	53.3	3.61	1.41	4.38	7	0.0
Apr	68.4	43.7	56.0	1.51	0.61	1.83	4	0.0
May	72.8	47.2	60.0	0.68	0.20	0.65	2	0.0
Jun	78.8	50.7	64.7	0.16	0.00	0.08	0	0.0
Jul	81.9	52.4	67.2	0.03	0.00	0.00	0	0.0
Aug	81.9	52.9	67.4	0.05	0.00	0.00	0	0.0
Sep	81.8	51.6	66.7	0.23	0.00	0.19	1	0.0
Oct	76.2	47.6	61.9	1.44	0.53	1.56	2	0.0
Nov	65.3	41.8	53.6	3.08	1.52	3.76	6	0.0
Dec	57.6	38.1	47.9	4.68	2.04	5.63	8	0.0
Annual:					18.28	28.12		
Average	70.7	45.6	58.1	-	-	-	-	-
Total	-	-	-	24.82			44	0.0

GROWING SEASON DATES			
Years with missing data:	24 deg = 8	28 deg = 8	32 deg = 7
Years with no occurrence:	24 deg = 40	28 deg = 8	32 deg = 0
Data years used:	24 deg = 45	28 deg = 45	32 deg = 46
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	No occurrence	1/22 to 12/25: 337 days	3/2 to 11/26: 269 days
70 percent *	No occurrence	1/5 to 1/12: 372 days	2/19 to 12/7: 291 days
* Percent chance of the growing season occurring between the Beginning and Ending dates.			

STATS TABLE - total precipitation (inches)													
Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1893		2.34	6.41	1.24	0.65	0.00	0.00		M0.12	0.19	3.75	3.54	18.24
1894	M8.61	M2.92	0.85	0.69	0.69	0.69			1.61	1.72		10.15	27.93
1895	9.89	M2.47	2.55	0.61	0.81		0.08		0.36	0.15			16.92
1896													
1897													
1898													
1899													
1900													
1901													
1902													
1903													
1904													

1905													
1906													
1907													
1908													
1909													
1910													
1911													
1912													
1913		0.70	1.95	1.01	0.69	0.01	0.11	T	T	0.00	6.68	9.17	20.32
1914	15.77	5.97	1.02	1.04	0.37	0.14	0.00		0.02	1.07	0.48	7.49	33.37
1915	8.77	11.70	3.14	0.45	3.19		M0.02			0.06	0.83	6.26	34.42
1916	16.59	3.31	1.92	0.02	M0.15	0.08	0.12	0.22	0.73	0.46	1.14	6.03	30.77
1917	2.12	5.46	1.16	0.63	0.09	0.00			0.10		0.59	1.91	12.06
1918	1.43	4.76	2.79	0.64	0.00	0.11		0.00	2.85	0.63	4.15	2.32	19.68
1919	3.78	7.60	2.13	0.19	T	0.00			0.25	0.37	0.31	4.35	18.98
1920	0.24	1.00	3.00	1.71		0.44	0.06		0.10	2.59	4.79	8.03	21.96
1921	8.47	0.97	1.60	0.35	M2.93	0.02			0.25	0.85	1.64	6.51	23.59
1922	1.94	4.90	2.15	M0.24	0.34	0.12		0.00		2.28	3.43	10.06	25.46
1923	M2.48	1.27		4.56	0.05	0.06	MT	0.17	1.00	0.22	0.76	1.10	11.67
1924	3.40	3.29	1.72	0.23	0.14		0.00		0.00	3.57	1.70	M5.98	20.03
1925	1.66	11.17	2.89	M4.17	4.60	M0.06	0.03	0.16	0.38	0.55	3.65	1.28	30.60
1926	6.14	7.15	0.36	6.62	0.50	0.00	0.00	0.01	0.10	1.94	9.73	1.93	34.48
1927									MT	1.84	3.84	3.53	9.21
1928	2.35	2.71	5.23	1.82	0.17	0.00	0.00	0.00	0.03	0.07	4.02	4.75	21.15
1929	1.39	M2.08	M1.32	1.08	T	1.57	0.00	0.00		M0.06	0.00	M5.74	13.24
1930	M4.61	M2.62	3.35	1.30	0.20	0.00	0.00	0.00	0.48	0.97	1.29	0.38	15.20
1931	6.85	1.28	1.98	0.63	0.77	0.97	0.00	0.00	T	1.00	M1.53	11.26	26.27
1932	2.78	2.32	0.76	0.89	2.06	T	0.00	0.00	T	T	1.24	3.58	13.63
1933	6.25	1.39	3.16	0.15	1.40	0.00	0.00	0.00	T	M1.91	0.00	7.22	21.48
1934	0.75	4.49	0.38	0.74	1.75	0.48	0.00	T	0.30	M1.50	M3.81	3.90	18.10
1935	7.07	2.09	5.70	3.22	0.00	0.00	0.00	0.09	0.30	0.69	1.57	2.76	23.49
1936	6.85	9.68	1.17	1.30	0.22	0.71	T	T	0.00	0.35	0.02	2.79	23.09
1937	4.94	7.57	7.18	1.00	T	M0.85	T	0.00	0.00	1.19	3.61	4.35	30.69
1938	4.43	9.38	8.58	1.93	T	0.00	0.00	0.00	0.51	1.02	1.28	2.50	29.63
1939	3.40	2.07	2.23	0.15	0.48	T	0.00	0.00	0.08	0.19	0.18	1.50	10.28
1940	9.98	10.19	5.46	2.14	1.22	0.04	0.00	0.00	0.08	1.30	1.91	11.86	44.18
1941	9.58	8.50	5.91	5.43	0.90	0.30	0.00	T	T	1.48	2.18	6.72	41.00
1942	6.09	6.47	M3.61	4.50	1.12	0.00	0.00	0.00	0.	0.	4.71	M4.	31.

									08	99		19	76
1943	7.48	2.22	3.77	1.47	0.07	0.07	0.00	0.00	0.00	0.43	M0.43	2.46	18.40
1944	M4.72	7.03	2.10	2.12	1.20	0.24	0.00	0.02	T	1.59	5.01	4.66	28.69
1945	2.75	4.02	4.12	0.03	0.62	0.00	T	0.00	0.05	2.84	4.15	10.96	29.54
1946	2.15	2.59	2.09	0.29	0.08	0.00	0.04	0.00	0.04	0.23	3.52	2.97	14.00
1947	0.76	2.63	M4.03	0.69	0.29	M1.26	0.00	0.00	0.00	3.37	1.20	M0.45	14.68
1948	1.82	2.03	3.75	5.11	0.50	0.07	0.00	0.00	0.03	0.51	0.87	4.67	19.36
1949	1.50	2.54	7.16	0.00	0.24	0.00	M0.00	M0.10	T	0.12	1.18	2.77	15.61
1950	9.18	3.90	1.86	1.20	0.39	0.00	0.00	0.00	0.00	2.78	5.93	7.41	32.65
1951	4.03	3.38	1.30	0.74	0.86	0.00	0.00	0.00	0.00	1.36	3.17	6.99	21.83
1952	10.46	2.66	4.61	0.70	0.10	0.26	0.00	0.00	0.00	0.15	2.48	11.66	33.08
1953	4.68	0.08	1.87	3.04	0.66	0.35	0.00	0.20	0.00	0.28	3.58	0.60	15.34
1954	5.11	2.97	5.25	1.55	0.09	0.36	0.01	0.39	T	0.22	4.05	4.91	24.91
1955	4.06	0.95	0.37	3.34	0.00	0.00	0.00	0.00	0.55	0.18	2.22	15.48	27.15
1956	9.85	4.65	0.33	2.23	0.61	0.00	T	T	0.08	1.41	0.09	0.35	19.60
1957	3.52	5.46	2.34	1.50	2.16	T	0.00	0.00	0.99	4.87	0.88	3.08	24.80
1958	5.57	11.23	5.21	5.72	0.46	0.32	T	0.00	0.04	0.09	0.18	1.13	29.95
1959	6.35	6.26	0.59	0.35	0.08	0.00	0.06	T	1.85	0.04	T	1.31	16.89
1960	5.88	4.76	2.24	1.01	0.66	0.00	0.00	0.00	0.02	0.40	3.91	2.75	21.63
1961	4.37	1.99	3.25	1.15	0.37	0.07	0.00	0.02	0.63	0.07	3.29	4.11	19.32
1962	1.30	9.15	3.32	0.43	0.00	0.00	0.00	0.03	0.08	7.29	0.61	3.32	25.53
1963	4.97	3.04	4.58	4.58	0.46	0.00	0.00	0.00	0.05	1.52	5.60	0.92	25.72
1964	4.63	0.26	1.81	0.08	0.21	0.84	0.05	T	0.00	2.42	5.42	5.81	21.53
1965	5.19	0.66	1.53	3.57	0.00	T	0.00	0.41	0.00	0.20	5.93	3.70	21.19
1966	5.00	3.10	0.55	0.46	0.12	0.18	0.00	0.11	0.05	0.00	6.42	5.47	21.46
1967	12.78	0.49	4.47	4.96	0.07	2.02	0.00	0.00	0.03	0.82	2.35	3.15	31.14
1968	6.58	3.70	3.43	0.32	0.58	0.00	0.00	0.62	0.03	1.84	3.20	5.72	26.02
1969	7.72	7.57	1.63	2.52	0.00	0.01	0.00	0.00	T	1.65	0.88		21.98
1970	13.34	2.34	2.48	0.17	0.00	0.48	0.00	0.00	0.00	0.96	9.11	6.40	35.28
1971	1.87	0.31	3.38	0.85	0.33	0.00	0.00	0.00	0.15	0.21	2.37	5.48	14.95
1972	1.67	2.40	0.38	1.08	T	0.15	0.01	T	0.92	4.46	5.26	4.50	20.83
1973	11.27	8.55	2.81	0.08	0.02	T	0.00	0.00	0.27	1.25	9.70	4.65	38.60
1974	5.30	1.83	4.72	2.30	0.00	0.02	0.95	0.00	0.00	0.91	0.89	3.40	20.32
1975	1.97	7.17	6.41	1.13	T	0.11	0.12	0.03	T	4.64	0.68	0.79	23.05
1976	0.32	1.95	0.97	1.51	0.00	0.01	0.00	0.62	0.	0.	1.54	0.89	8.98

									57	60			
1977	1.80	1.26	2.00	0.06	0.82	0.00	0.00	0.00	0.73	0.41	4.70	4.16	15.94
1978	12.58	4.62	4.24	3.68	0.09	0.00	0.00	0.00	0.46	0.00	1.51	0.73	27.91
1979	10.45	5.61	1.73	1.17	0.38	0.00	0.00	0.00	0.09	3.40	M3.02	5.60	31.45
1980	5.89	10.26	M1.38	1.08	0.24	0.05	0.19	0.00	T	0.34	0.32	M3.30	23.05
1981	5.93	M1.37	4.24	0.07	0.38	0.00	0.20	0.00	0.00	2.19	M5.29	M8.11	27.78
1982	M9.48	3.44	5.58	3.28	0.00	0.01	0.00	0.00	0.64	2.91	6.72	2.74	34.80
1983		9.11	15.04	4.59	0.28	0.00	0.00	0.48	0.42	0.61	8.75	9.43	48.71
1984	0.41	1.92	1.43	1.33	0.19	0.26	T	0.13	0.15	2.25	7.43	1.64	17.14
1985	1.20	2.41	4.07	0.54	T	0.01	0.06	0.00	0.08	0.98	3.68	3.48	16.51
1986	4.58	15.26	7.07	1.15	0.44	0.00	T	0.00	1.67	0.24	0.26	2.33	33.00
1987	4.40	4.53	3.29	0.08	0.04	0.00	0.00	0.00	0.00	1.42	3.04	6.39	23.19
1988	5.43	0.55	0.08	M1.24	0.67	0.73	0.00	0.00	0.00	0.09	3.25	2.81	14.85
1989	1.39	0.99	6.14	1.08	0.15	0.01	0.00	0.00	1.77	1.69	1.77	0.00	14.99
1990	5.06	3.48	0.99	0.31	2.34	0.00	0.00		0.12				12.30
1991	0.36	4.33	8.67	0.46	0.20	0.60	M0.00	0.08					14.70
1992	2.14	M7.29	M5.11	M1.27	0.00	M1.12	0.00	T	0.04	M2.81	0.50	M7.89	28.17
1993	8.62	5.27	M2.10	M0.84	1.40	0.80	T	0.00	T	1.63	2.94	2.46	26.06
1994	2.38	4.45	0.29	1.51	1.21	0.04	0.00	0.00	0.00	1.20	7.21	3.22	21.51
1995	16.31	1.00	11.98	1.35	1.89	0.43	T	0.00	0.00	0.00	0.28	9.10	42.34
1996	5.58	8.04	2.54	3.40	2.37	T	T	0.00	0.10	1.01	2.73	10.82	36.59
1997	8.65	0.48	0.60	M0.30	0.38	M0.05	0.00	1.04	0.20	0.94	7.69	2.40	22.73
1998	9.49	19.59	2.55	2.95	3.74	0.01	0.00	0.00	0.04	0.85	5.47	1.24	45.93
1999	3.82	10.00	3.54	2.04	0.10		0.00	0.00	0.03	0.74	3.12	0.74	24.13
2000	4.95	10.25		1.65	1.21	0.16	0.00	0.01	0.20	2.00	1.35	0.71	22.49
2001	4.53		1.52	1.22	0.00	0.01	0.00	0.01	M0.10	0.59	5.39	8.64	22.01
2002	3.49	2.23	1.97	0.56	0.93	0.00	0.00	0.00	0.00	0.00	3.21	12.30	24.69
2003	2.12	1.49	0.76	3.34	1.22	T	T	0.00	0.03	0.27	1.76	7.27	18.26
2004	2.45	6.41	0.74	0.41	0.08	0.00	0.00	0.00	0.25	4.67	2.33	9.28	26.62
2005	4.64	4.35	4.35	1.54	3.03	0.86	0.00	0.01	0.00	0.62	1.61	13.12	34.13
2006	4.37	4.28	8.08	4.99	0.32	0.00	0.00	0.00	0.00	0.67	2.98	4.68	30.37
2007	0.79	5.31	0.20	1.36	0.23	0.00	0.10	0.00	0.10	1.82	0.69	3.67	14.27
2008	9.68	2.93	0.32	0.08	0.16	M0.00	0.00	0.00	0.04	0.54	2.11	2.15	18.01
2009	0.75	7.71	2.13	0.54	1.70	0.07	0.00	0.00	0.17	3.16	0.61	M2.01	18.85
2010	9.15	3.73	2.72	4.05	1.49	T	0.00	0.00	0.	M2.	2.53	8.35	34.

									00	46			48
2011	1.43	3.89	M9.88	0.55	1.60	2.32	0.00	0.00	0.00	2.06	1.62	0.10	23.45
2012	4.61	1.26	6.34	1.56	0.01	0.03	0.00	T	0.00	1.30	6.13	7.01	28.25
2013	0.60	0.44	0.80	1.15	0.21	0.56	0.00	0.00	0.61	0.00	0.87	0.38	5.62
2014	0.12	9.60	2.90	1.61	M0.00	0.00	0.02	0.05	0.42	0.59	3.25	15.60	34.16
2015	0.03	2.86	0.08	1.27	0.37	0.26	0.06	0.00	0.04	0.06	1.96	4.99	11.98
2016	6.96	0.88	6.63	1.05	0.31	0.00	0.00	0.00	0.00	5.56	3.09	3.92	28.40
2017	11.85	9.93	2.67	2.76	0.00	0.23	0.00	0.00	0.02	0.00	3.67	0.08	31.21
2018	4.80	0.15	5.24	4.55	0.35	0.00	0.00	0.00	0.00	1.34	4.19	2.42	23.04
2019	5.75	10.96	5.33	0.61	2.81	0.00	0.00	M0.00	0.05	0.02	M0.76	6.56	32.85
2020	2.55	0.00	2.15	1.07	M1.41	0.00	0.00	0.18	0.00	M0.00	M0.66	M1.67	9.69
2021	3.66	M0.90	1.73	0.05	0.00	0.00	0.00	0.00	0.09	M7.96	1.61	M5.91	21.91
2022	0.66	0.08	0.84	2.07	M0.00	0.42	0.00	0.03	1.02	0.00	1.53	8.29	14.94
2023	9.58	3.38	M8.52	0.30	0.80	M0.01							22.59
Notes: Data missing in any month have an "M" flag. A "T" indicates a trace of precipitation.													
Data missing for all days in a month or year is blank.													
Creation date: 2023-06-27													

Appendix C
Datasheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: PIPS Parallel Force Main Project City/County: Petaluma/Sonoma Sampling Date: 06-15-20232

Applicant/Owner: City of Petaluma State: CA Sampling Point: DP1

Investigator(s): Nicole Ibanez, Liza Ryan Section, Township, Range: S34, T5N R7W

Landform (hillslope, terrace, etc.): Top of bank Local relief (concave, convex, none): concave Slope (%): 10

Subregion (LRR): C Lat: 38.23188 Long: -122.611422 Datum: NAD83

Soil Map Unit Name: Reyes clay, 0 to 2 percent slopes NWI classification: E2SBNx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland? Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' radius)			
1. Salicornia pacifica	30	Yes	OBL
2. Distichlis spicata	20	Yes	FAC
3. Rumex crispus	12	No	FAC
4. Festuca perennis	4	No	FAC
5. Bolboschoenus maritimus	5	No	OBL
6. Atriplex prostrata	1	No	FACW
7.			
8.			
= Total Cover	72		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 28 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: DP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	90	2.5YR 6/1	10	D	M	Silty Clay	
6-11	10YR 6/2	95	2.5 YR 7/8	3	C	PL	Silty Clay	
			2.5YR 7/1	2	D	PL		
11-15	10YR 5/1	91	7.5YR 4/4	2	C	M	Silty Clay	
			10YR 7/2	7	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Stratified Layers (A5) (**LRR C**)
__ 1 cm Muck (A9) (**LRR D**)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (S1)
__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Loamy Mucky Mineral (F1)
__ Loamy Gleyed Matrix (F2)
✓ Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
__ Redox Depressions (F8)
__ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

__ 1 cm Muck (A9) (**LRR C**)
__ 2 cm Muck (A10) (**LRR B**)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ________

Depth (inches): ________

Hydric Soil Present? Yes ✓ **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

__ Surface Water (A1)
__ High Water Table (A2)
✓ Saturation (A3)
__ Water Marks (B1) (**Nonriverine**)
__ Sediment Deposits (B2) (**Nonriverine**)
✓ Drift Deposits (B3) (**Nonriverine**)
__ Surface Soil Cracks (B6)
__ Inundation Visible on Aerial Imagery (B7)
__ Water-Stained Leaves (B9)
__ Salt Crust (B11)
✓ Biotic Crust (B12)
__ Aquatic Invertebrates (B13)
__ Hydrogen Sulfide Odor (C1)
__ Oxidized Rhizospheres along Living Roots (C3)
__ Presence of Reduced Iron (C4)
__ Recent Iron Reduction in Tilled Soils (C6)
__ Thin Muck Surface (C7)
__ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

__ Water Marks (B1) (**Riverine**)
__ Sediment Deposits (B2) (**Riverine**)
__ Drift Deposits (B3) (**Riverine**)
__ Drainage Patterns (B10)
__ Dry-Season Water Table (C2)
__ Crayfish Burrows (C8)
__ Saturation Visible on Aerial Imagery (C9)
__ Shallow Aquitard (D3)
__ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches):
Water Table Present?	Yes ✓	No ____	Depth (inches): 14
Saturation Present? (includes capillary fringe)	Yes ✓	No ____	Depth (inches): 3

Wetland Hydrology Present? Yes ✓ **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: PIPS Parallel Force Main Project City/County: Petaluma/Sonoma Sampling Date: 06-15-20232

Applicant/Owner: City of Petaluma State: CA Sampling Point: DP2

Investigator(s): Nicole Ibanez, Liza Ryan Section, Township, Range: S34, T5N R7W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 25

Subregion (LRR): C Lat: 38.231903 Long: -122.611419 Datum: NAD83

Soil Map Unit Name: Reyes clay, 0 to 2 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ✓	**Is the Sampled Area within a Wetland?** Yes ___ No ✓
Hydric Soil Present?	Yes ✓	No ___	
Wetland Hydrology Present?	Yes ___	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' radius)			
1. Avena barbata	60	Yes	UPL
2. Festuca perennis	10	No	FAC
3. Helminthotheca echioides	5	No	FAC
4. Lactuca serriola	1	No	FACU
5. Distichlis spicata	10	No	FAC
6. Lepidium latifolium	5	No	FAC
7.			
8.			
= Total Cover	91		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 9 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

SOIL

Sampling Point: DP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1	100					Clay loam	
8-12	2.5Y 4/2	97	2.5 Y 4/6	3	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: PIPS Parallel Force Main Project City/County: Petaluma/Sonoma Sampling Date: 06-15-20232

Applicant/Owner: City of Petaluma State: CA Sampling Point: DP3

Investigator(s): Nicole Ibanez, Liza Ryan Section, Township, Range: S34, T5N R7W

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): C Lat: 38.231839 Long: -122.610586 Datum: NAD83

Soil Map Unit Name: Reyes clay, 0 to 2 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____
Hydric Soil Present?	Yes ____	No ✓
Wetland Hydrology Present?	Yes ____	No ✓

Is the Sampled Area within a Wetland? Yes ____ No ✓

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ____)			
1. Rumex crispus	12	No	FAC
2. Festuca perennis	5	Yes	FAC
3. Cressa truxillensis	25	Yes	FAC
4. Hordeum marinum	15	Yes	FAC
5. Distichlis spicata	5	No	FAC
6. Helminthotheca echioides	15	Yes	FAC
7. Xanthium spinosum	2	No	UPL
8.			
= Total Cover	79		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 21 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ✓ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: DP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	5YR 2.5/1	60	7.5YR 5/8	1	C	M	loam	
	2.5 Y 6/3	39						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Stratified Layers (A5) (**LRR C**)
__ 1 cm Muck (A9) (**LRR D**)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (S1)
__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Loamy Mucky Mineral (F1)
__ Loamy Gleyed Matrix (F2)
__ Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
__ Redox Depressions (F8)
__ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

__ 1 cm Muck (A9) (**LRR C**)
__ 2 cm Muck (A10) (**LRR B**)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ________

Depth (inches): ________

Hydric Soil Present? Yes ____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

__ Surface Water (A1)
__ High Water Table (A2)
__ Saturation (A3)
__ Water Marks (B1) (**Nonriverine**)
__ Sediment Deposits (B2) (**Nonriverine**)
__ Drift Deposits (B3) (**Nonriverine**)
__ Surface Soil Cracks (B6)
__ Inundation Visible on Aerial Imagery (B7)
__ Water-Stained Leaves (B9)
__ Salt Crust (B11)
__ Biotic Crust (B12)
__ Aquatic Invertebrates (B13)
__ Hydrogen Sulfide Odor (C1)
__ Oxidized Rhizospheres along Living Roots (C3)
__ Presence of Reduced Iron (C4)
__ Recent Iron Reduction in Tilled Soils (C6)
__ Thin Muck Surface (C7)
__ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

__ Water Marks (B1) (**Riverine**)
__ Sediment Deposits (B2) (**Riverine**)
__ Drift Deposits (B3) (**Riverine**)
__ Drainage Patterns (B10)
__ Dry-Season Water Table (C2)
__ Crayfish Burrows (C8)
__ Saturation Visible on Aerial Imagery (C9)
__ Shallow Aquitard (D3)
__ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ______
Water Table Present? Yes ____ No ✓ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): ______

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: PIPS Parallel Force Main Project City/County: Petaluma/Sonoma Sampling Date: 06-15-20232

Applicant/Owner: City of Petaluma State: CA Sampling Point: DP4

Investigator(s): Nicole Ibanez, Liza Ryan Section, Township, Range: S35, T5N R7W

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): C Lat: 38.231503 Long: -122.608709 Datum: NAD83

Soil Map Unit Name: Clear Lake clay, sandy substratum, 0 to 2 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	Is the Sampled Area within a Wetland? Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' radius)			
1. Xanthium strumarium	50	Yes	FAC
2. Helminthotheca echioides	2	No	FAC
3. Rumex crispus	3	No	FAC
4. Cyperus eragrostis	1	No	FACW
5.			
6.			
7.			
8.			
= Total Cover	56		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 44 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: DP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	99	7.5YR 4/6	1	C	M	loam	
4-12	10 YR 4/1	98	7.5 YR 5/8	2	C	M	Loamy cl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ✓ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ✓ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ________

Water Table Present? Yes ___ No ✓ Depth (inches): ________

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ________

Wetland Hydrology Present? **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: PIPS Parallel Force Main Project City/County: Petaluma/Sonoma Sampling Date: 06-15-20232

Applicant/Owner: City of Petaluma State: CA Sampling Point: DP5

Investigator(s): Nicole Ibanez, Liza Ryan Section, Township, Range: S34, T5N R7W

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): C Lat: 38.232558 Long: -122.618109 Datum: NAD83

Soil Map Unit Name: Alluvial land, sandy NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland? Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' radius)			
1. Atriplex prostrata	55	Yes	FACW
2. Polypogon monspeliensis	1	No	FACW
3. Festuca perennis	2	No	FAC
4.			
5.			
6.			
7.			
8.			
= Total Cover	58		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 42 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: DP5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5Y 4/2	95	7.5YR 5/6	5	C	M	loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ✓ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No ✓	Depth (inches): ___
Water Table Present?	Yes ___	No ✓	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✓	Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix D
Representative Photographs

Photo 1. Photo of a seasonal wetland. Taken on June 15, 2023, from Photo Point (PP) 1 (Figure F-1, Appendix F).

Photo 2. Photo of a tidal channel, bordered by saline emergent wetland. Taken on June 15, 2023, from PP 2 (Figure F-1, Appendix F).

Photo 3. Photo of an intermittent channel. Taken on June 15, 2023, from PP 3 (Figure F-4, Appendix F).

Photo 4. Photo of Adobe Creek, facing downstream. Taken on June 15, 2023, from PP 4 (Figure F-3, Appendix F).

Photo 5. Photo of a freshwater emergent wetland. Taken on June 15, 2023, from PP 5 (Figure F-5, Appendix F).

Photo 6. Photo the seasonal pond. Taken on June 15, 2023, from PP 6 (Figure F-5, Appendix F).

Photo 7. Photo of a perennial pond. Taken on June 15, 2023, from PP 7 (Figure F-5, Appendix F).

Photo 8. Photo of the riparian corridor surrounding Adobe Creek. Taken on June 15, 2023, from PP 8 (Figure F-3, Appendix F).

Photo 9. Photo of Data Point 1. Taken on June 15, 2023 (Figure F-2, Appendix F).

Photo 10. Photo of Data Point 2. Taken on June 15, 2023 (Figure F-2, Appendix F).

Photo 11. Photo of Data Point 3. Taken on June 15, 2023 (Figure F-2, Appendix F).

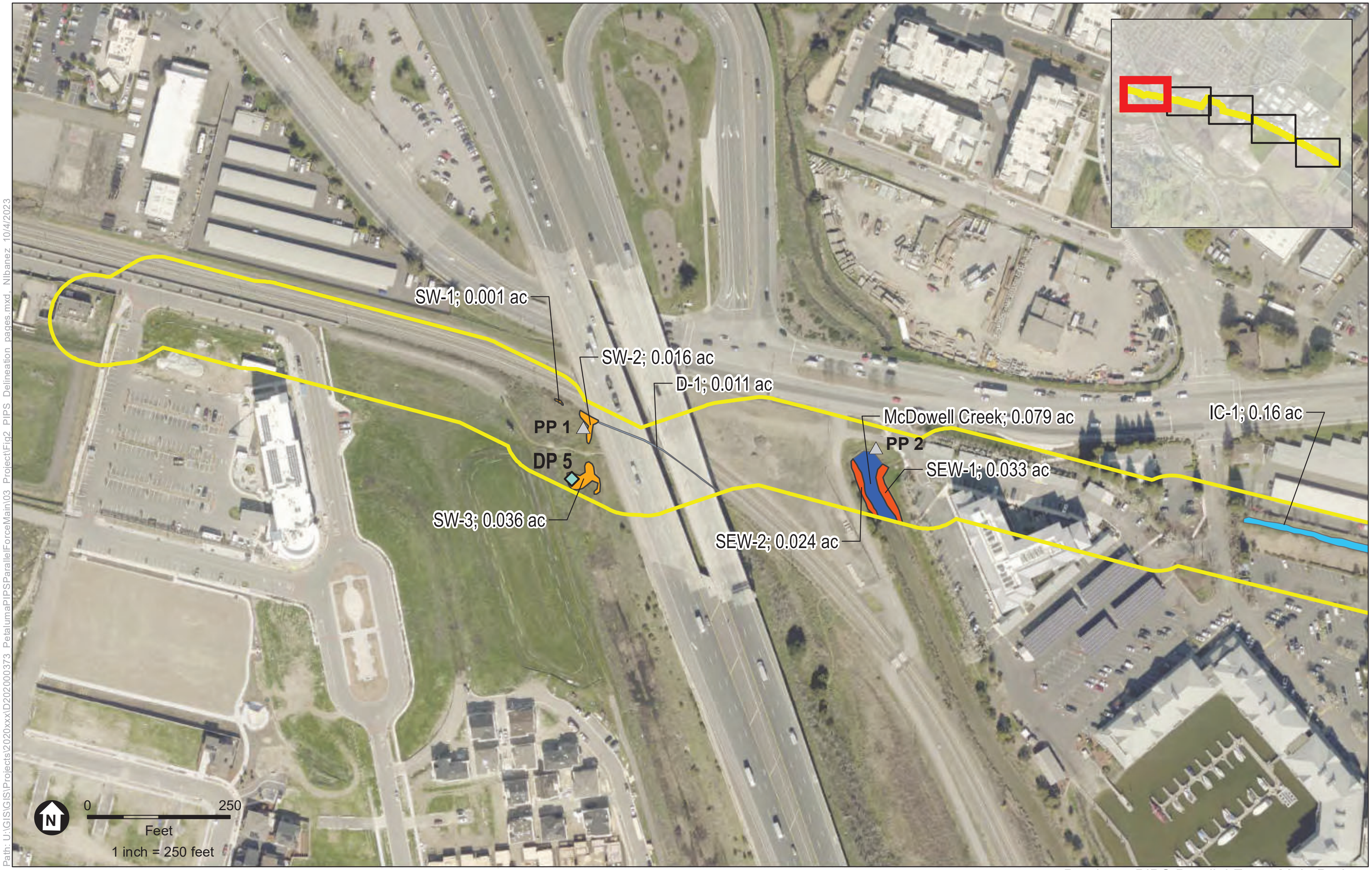
Photo 12. Photo of Data Point 4. Taken on June 15, 2023 (Figure F-2, Appendix F).

Photo 13. Photo of Data Point 5. Taken on June 15, 2023 (Figure F-1, Appendix F).

Appendix E
Aquatic Resources Table

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway
Ditch	CALIFORNIA	R6		Area	0.011	ACRE	NRPW	38.23270030	-122.61799620	
Ephemeral Channel	CALIFORNIA	R6		Area	0.053	ACRE	NRPW	38.22439960	-122.58399960	
Freshwater Emergent Wetland-1	CALIFORNIA	PEM		Area	1.008	ACRE	RPWWD	38.22859950	-122.59500120	
Freshwater Emergent Wetland-2	CALIFORNIA	PEM		Area	0.051	ACRE	RPWWD	38.22529980	-122.58699800	
Freshwater Emergent Wetland-3	CALIFORNIA	PEM		Area	0.019	ACRE	RPWWD	38.22499850	-122.58599850	
Adobe Creek	CALIFORNIA	R4SB		Area	0.128	ACRE	RPW	38.23040010	-122.60199740	Adobe Creek
Intermittent Channel-1	CALIFORNIA	R4SB		Area	0.160	ACRE	RPW	38.23229980	-122.61299900	
Intermittent Channel-2	CALIFORNIA	R4SB		Area	0.058	ACRE	RPW	38.22919850	-122.59700010	
Intermittent Channel-3	CALIFORNIA	R4SB		Area	0.272	ACRE	RPW	38.22760010	-122.59300230	
McDowell Creek	CALIFORNIA	E1UB		Area	0.079	ACRE	TNW	38.23260120	-122.61599730	McDowell Creek
Perennial Channel-1	CALIFORNIA	E1UB		Area	0.076	ACRE	RPW	38.23160170	-122.61100010	
Perennial Channel-2	CALIFORNIA	E1UB		Area	0.097	ACRE	RPW	38.23160170	-122.61000060	
Perennial Pond-1	CALIFORNIA	PUB		Area	0.275	ACRE	ISOLATE	38.22449870	-122.58399960	
Perennial Pond-2	CALIFORNIA	PUB		Area	0.230	ACRE	ISOLATE	38.22409820	-122.58300020	
Perennial Pond-3	CALIFORNIA	PUB		Area	0.014	ACRE	ISOLATE	38.22359850	-122.58200070	
Saline Emergent Wetland-1	CALIFORNIA	E2EM		Area	0.033	ACRE	TNWW	38.23249820	-122.61599730	
Saline Emergent Wetland-2	CALIFORNIA	E2EM		Area	0.024	ACRE	TNWW	38.23249820	-122.61599730	
Saline Emergent Wetland-3	CALIFORNIA	E2EM		Area	0.303	ACRE	RPWWD	38.23160170	-122.61000060	
Saline Emergent Wetland-4	CALIFORNIA	E2EM		Area	0.320	ACRE	RPWWD	38.23160170	-122.61100010	
Seasonal Pond	CALIFORNIA	PUB		Area	0.638	ACRE	ISOLATE	38.22499850	-122.58499910	
Seasonal Wetland-1	CALIFORNIA	PEM		Area	0.001	ACRE	ISOLATE	38.23289870	-122.61799620	
Seasonal Wetland-2	CALIFORNIA	PEM		Area	0.016	ACRE	ISOLATE	38.23279950	-122.61799620	
Seasonal Wetland-3	CALIFORNIA	PEM		Area	0.036	ACRE	ISOLATE	38.23260120	-122.61799620	
Seasonal Wetland-4	CALIFORNIA	PEM		Area	0.022	ACRE	RPWWN	38.23139950	-122.60800170	
Seasonal Wetland-5	CALIFORNIA	PEM		Area	0.008	ACRE	ISOLATE	38.23120120	-122.60700230	
Seasonal Wetland-6	CALIFORNIA	PEM		Area	0.009	ACRE	ISOLATE	38.22549820	-122.58599850	
Seasonal Wetland-7	CALIFORNIA	PEM		Area	0.578	ACRE	ISOLATE	38.22399900	-122.58300020	

Appendix F
Aquatic Resources Delineation Map



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SOURCE: ESA, 2023

Petaluma PIPS Parallel Force Main Project

Survey Area
Culvert
Photo points (PP)
Riparian (0.27 ac)

Data Points (DP)
Upland
Wetland

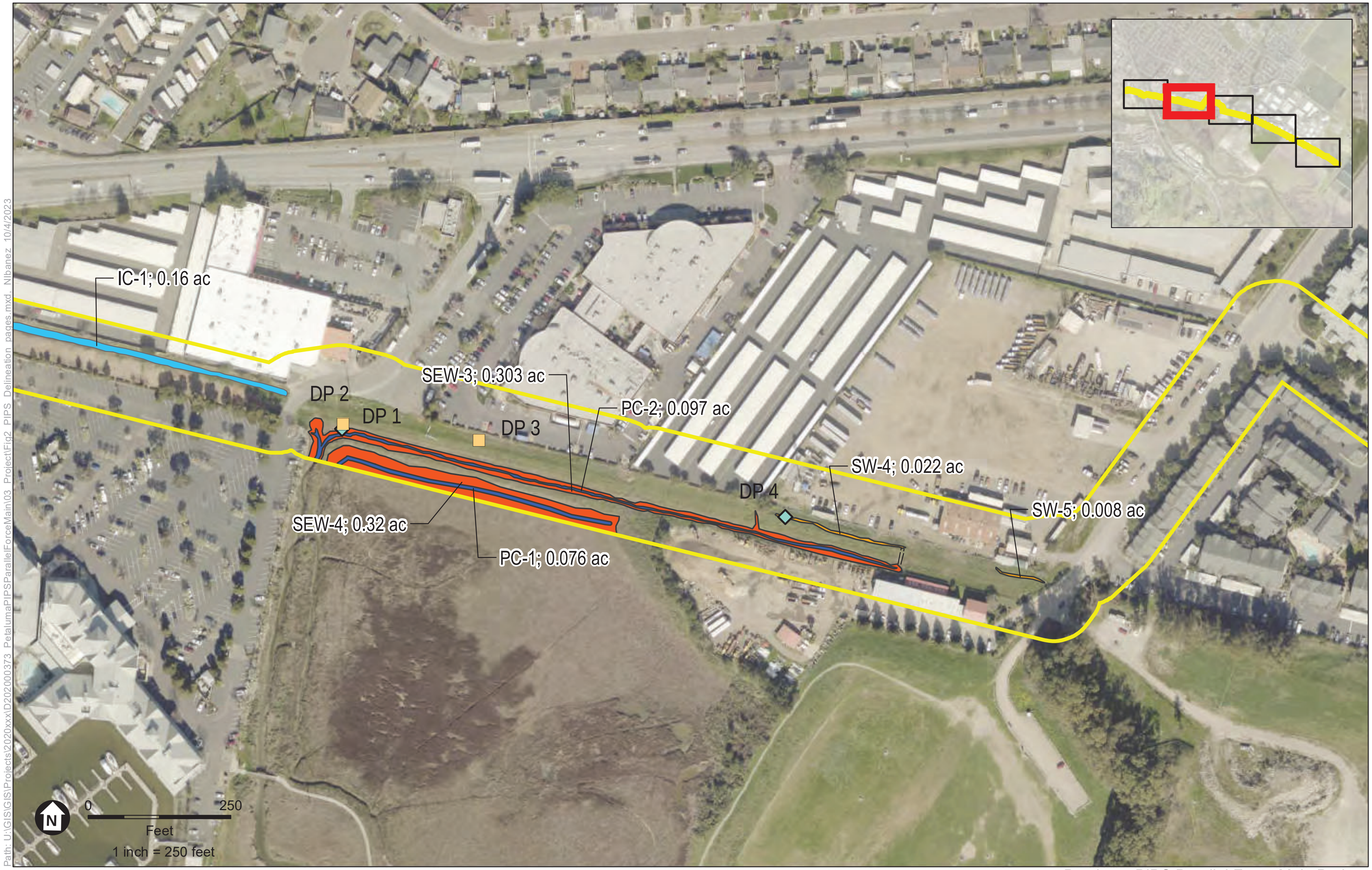
Wetlands (2.43 ac)
Freshwater Emergent Wetland (FEW; 1.08 ac)
Saline Emergent Wetland (SEW; 0.68 ac)
Seasonal Wetland (SW; 0.67 ac)

Other Waters (2.09 ac)
Ditch (D; 0.01 ac)
Ephemeral Channel (EC; 0.05 ac)
Intermittent Channel (IC; 0.62 ac)
Perennial Channel (PC; 0.25 ac)
Perennial Pond (0.52 ac)
Seasonal Pond (SP; 0.64 ac)

Appendix F-1
Aquatic Resources Map
(1 of 5)

Coordinate System: State Plane California Zone II (US Feet)
Projection: Lambert Conformal Conic
Datum: NAD 1983 (2011)

Delineated by: Nicole Ibañez
Mapping by: Nicole Ibañez
Created on: 7/21/2023



SOURCE: ESA, 2023

Petaluma PIPS Parallel Force Main Project

Survey Area
Culvert
Photo points (PP)
Riparian (0.27 ac)

Data Points (DP)
Upland
Wetland

Wetlands (2.43 ac)
Freshwater Emergent Wetland (FEW; 1.08 ac)
Saline Emergent Wetland (SEW; 0.68 ac)
Seasonal Wetland (SW; 0.67 ac)

Other Waters (2.09 ac)
Ditch (D; 0.01 ac)
Ephemeral Channel (EC; 0.05 ac)
Intermittent Channel (IC; 0.62 ac)
Perennial Channel (PC; 0.25 ac)
Perennial Pond (0.52 ac)
Seasonal Pond (SP; 0.64 ac)

Appendix F-2
Aquatic Resources Map
(2 of 5)

Coordinate System: State Plane California Zone II (US Feet)
Projection: Lambert Conformal Conic
Datum: NAD 1983 (2011)

Delineated by: Nicole Ibañez
Mapping by: Nicole Ibañez
Created on: 7/21/2023

Path: U:\GIS\GIS\Projects\2020xxx\D202000373_PetalumaPIPSParallelForceMain\03_Project\Fig2_PIPS_Delineation_pages.mxd, NIbanez 10/4/2023

SOURCE: ESA, 2023

Petaluma PIPS Parallel Force Main Project

Survey Area
Culvert
Photo points (PP)
Riparian (0.27 ac)

Data Points (DP)
Upland
Wetland

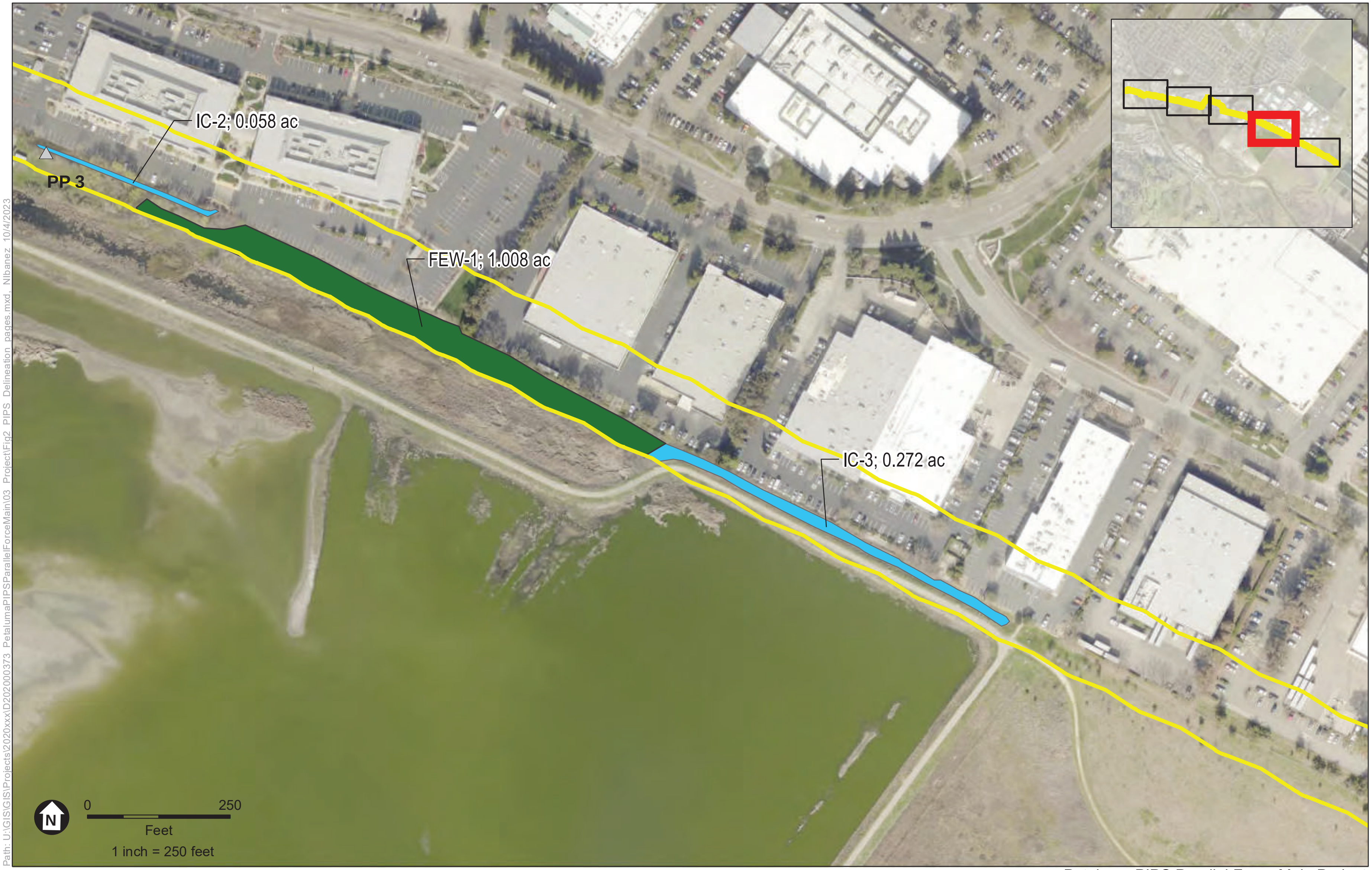
Wetlands (2.43 ac)
Freshwater Emergent Wetland (FEW; 1.08 ac)
Saline Emergent Wetland (SEW; 0.68 ac)
Seasonal Wetland (SW; 0.67 ac)

Other Waters (2.09 ac)
Ditch (D; 0.01 ac)
Ephemeral Channel (EC; 0.05 ac)
Intermittent Channel (IC; 0.62 ac)
Perennial Channel (PC; 0.25 ac)
Perennial Pond (0.52 ac)
Seasonal Pond (SP; 0.64 ac)

Appendix F-3
Aquatic Resources Map
(3 of 5)

Coordinate System: State Plane California Zone II (US Feet)
Projection: Lambert Conformal Conic
Datum: NAD 1983 (2011)

Delineated by: Nicole Ibañez
Mapping by: Nicole Ibañez
Created on: 7/21/2023



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SOURCE: ESA, 2023

Petaluma PIPS Parallel Force Main Project

Survey Area
Culvert
Photo points (PP)
Riparian (0.27 ac)

Data Points (DP)
Upland
Wetland

Wetlands (2.43 ac)
Freshwater Emergent Wetland (FEW; 1.08 ac)
Saline Emergent Wetland (SEW; 0.68 ac)
Seasonal Wetland (SW; 0.67 ac)

Other Waters (2.09 ac)
Ditch (D; 0.01 ac)
Ephemeral Channel (EC; 0.05 ac)
Intermittent Channel (IC; 0.62 ac)
Perennial Channel (PC; 0.25 ac)
Perennial Pond (0.52 ac)
Seasonal Pond (SP; 0.64 ac)

Appendix F-4
Aquatic Resources Map
(4 of 5)

Coordinate System: State Plane California Zone II (US Feet)
Projection: Lambert Conformal Conic
Datum: NAD 1983 (2011)

Delineated by: Nicole Ibañez
Mapping by: Nicole Ibañez
Created on: 7/21/2023

Path: U:\GIS\GIS\Projects\2020xxx\D202000373 PetalumaPIPSParallelForceMain\03 Project\Fig2 PIPS Delineation pages.mxd NIbanez 10/4/2023

SOURCE: ESA, 2023

Petaluma PIPS Parallel Force Main Project

Survey Area
Culvert
Photo points (PP)
Riparian (0.27 ac)

Data Points (DP)
Upland
Wetland

Wetlands (2.43 ac)
Freshwater Emergent Wetland (FEW; 1.08 ac)
Saline Emergent Wetland (SEW; 0.68 ac)
Seasonal Wetland (SW; 0.67 ac)

Other Waters (2.09 ac)
Ditch (D; 0.01 ac)
Ephemeral Channel (EC; 0.05 ac)
Intermittent Channel (IC; 0.62 ac)
Perennial Channel (PC; 0.25 ac)
Perennial Pond (0.52 ac)
Seasonal Pond (SP; 0.64 ac)

Appendix F-5
Aquatic Resources Map
(5 of 5)

Coordinate System: State Plane California Zone II (US Feet)
Projection: Lambert Conformal Conic
Datum: NAD 1983 (2011)

Delineated by: Nicole Ibañez
Mapping by: Nicole Ibañez
Created on: 7/21/2023

APPENDIX C: BIOLOGICAL RESOURCES REPORT

PIPS PARALLEL FORCE MAIN DESIGN PROJECT
PETALUMA, CALIFORNIA

Biological Resources Report

Prepared for
Woodard & Curran

October 2023

PIPS PARALLEL FORCE MAIN DESIGN PROJECT
PETALUMA, CALIFORNIA

Biological Resources Report

Prepared for
Woodard & Curran

October 2023

75 Baywood Drive
Suite 100
Petaluma, CA 94954
707.795.0900
esassoc.com

ESA

TABLE OF CONTENTS

PIPS Parallel Force Main Design Project Biological Resources Report

Figures

Appendices

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EXECUTIVE SUMMARY

The City of Petaluma (City) owns and operates the Primary Influent Pump Station (PIPS), which collects a majority of the City's sewage flow and pumps it through a single 36-inch diameter force main to the Ellis Creek Water Recycling Facility (ECWRF). The existing force main was constructed in 1973 and due to its age, the City proposes to construct a parallel force main between 10 and 20 feet from the existing pipeline. The new force main would run underneath U.S. Highway 101 and the Sonoma-Marin Area Rail Transit (SMART) tracks, across Adobe and McDowell creeks, and underneath roads and pathways in Shollenberger Park and the extension by Ellis Creek. This report is intended to characterize biological resources along the parallel force main alignment, the proposed multi-use path, and within a surrounding buffer area (the study area), as well as to provide recommendations to avoid and minimize potential impacts to sensitive biological resources.

The study area includes a 75-foot buffer on each side of the pipeline alignment. In the segment which would include the proposed multi-use path, the buffer was increased to 100 feet on each side of the alignment. Vegetation communities and wildlife habitat in the study area include non-native annual grassland, disturbed land (including parking lots, pathways and roads), small amounts of riparian woodland at Adobe Creek, and freshwater marsh within Shollenberger Park. Riparian woodland and freshwater marsh are considered sensitive vegetation communities. State- and federally-jurisdictional waters are present in Adobe Creek and wetlands in Petaluma Marsh, Shollenberger Park, and ECWRF lands. However, only small fragments of marsh are present within the study area. No special-status plant species were observed during the reconnaissance surveys, nor are any expected to occur there due to the absence of suitable habitat and high levels of disturbance.

One special-status wildlife species, San Pablo song sparrow, a California Species of Special Concern was observed in the marshland during the first biological reconnaissance survey. Other federal and state-listed species including Ridgway's rail, California black rail, salt marsh harvest mouse, white-tailed kite, and numerous other bird species may be present near the project alignment. Bird species may seasonally nest in the grassland, riparian woodland, or marshland habitats in and near the study area.

Project construction could impact sensitive natural communities, wetlands or special-status species, which may be significant impacts under the California Environmental Quality Act (CEQA). However, avoiding sensitive habitats, and obtaining required permits from federal and state regulatory agencies for impacts that cannot be avoided, as described in Chapter 4, would minimize these impacts. For special-status species, avoidance and minimization measures could include limiting work to outside nesting season, pre-construction surveys by a qualified biologist, and establishing an exclusion fence around the work area in sensitive habitats. For migratory birds, active nests are protected by the Migratory Bird Treaty Act and California Fish and Game

Codes 3503 and 3503.5. Potential impacts to nesting birds could be reduced following the implementation of avoidance and minimization measures, including preconstruction surveys and nest avoidance (see *Section 4.2*).

CHAPTER 1
Introduction & Methodology

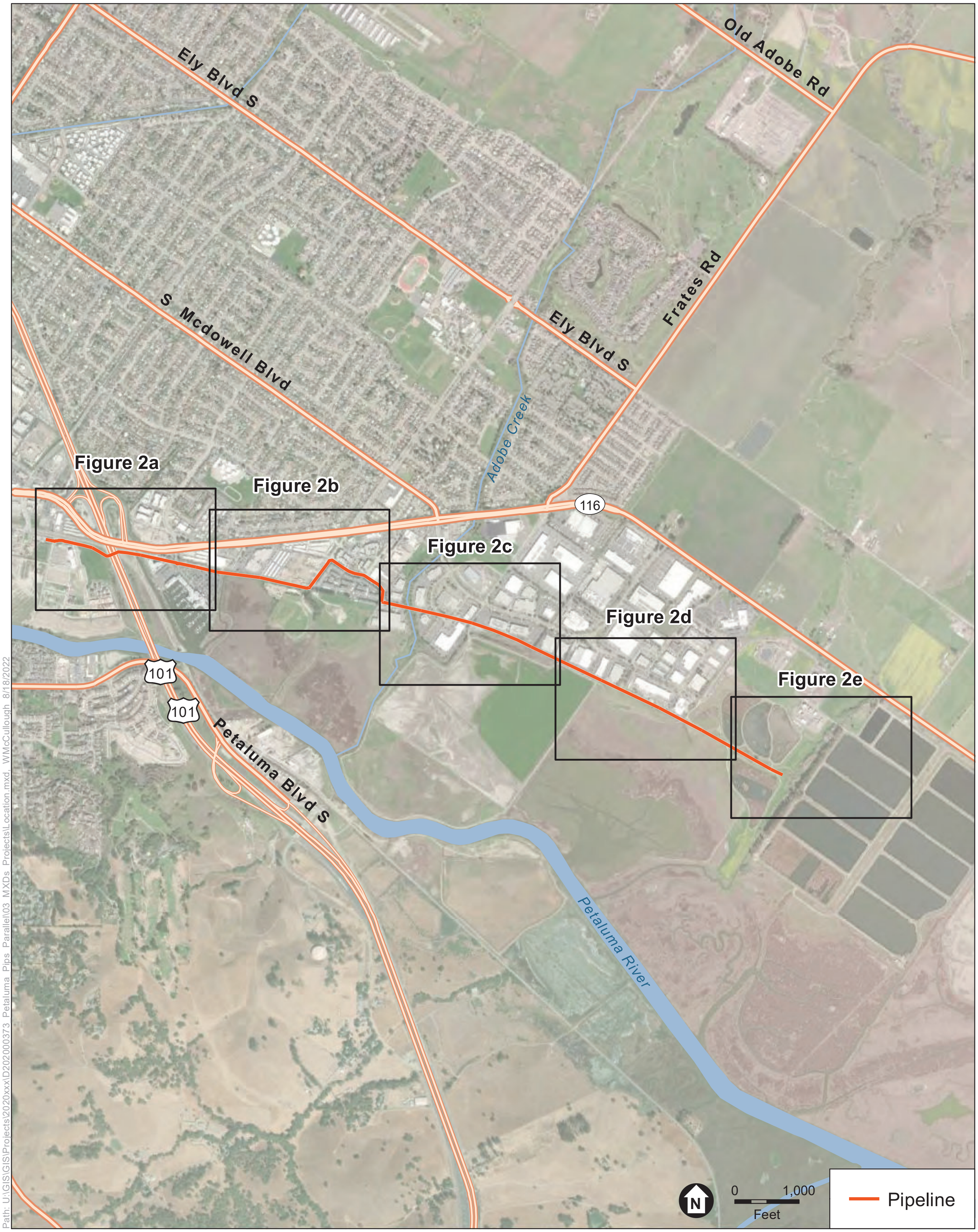
1.1 Background and Purpose

The City of Petaluma (City) owns and operates the Primary Influent Pump Station (PIPS), which collects a majority of the City's sewage flow and pumps it through a single 36-inch diameter force main to the Ellis Creek Water Recycling Facility (ECWRF). The 36-inch force main is approximately 2.5 miles long and was constructed in 1973, at the same time as the construction of the PIPS facility. The existing force main is constructed entirely of concrete lined and coated rod reinforced steel cylinder pipe (concrete cylinder pipe).

The reliability of the force main is of upmost importance because it conveys nearly all of the City's sewage to the ECWRF. Without redundancy or alternative conveyance options, taking the force main offline for any reason is extremely expensive and labor intensive. This issue came into focus in 2013 when Caltrans damaged the force main during construction of new support columns as part of a U.S. Highway 101 widening project. Caltrans proceeded to install a new 54-inch diameter welded steel casing under the railroad tracks approximately 20 feet south of the existing force main to support the future construction of a parallel force main. Coupled with the age of the existing pipeline, this damage highlighted the need for the City to plan, design, and construct a parallel force main. The proposed project also includes construction of a 2,100-foot-long Caltrans Class 1 off-street multi-use bicycle pathway between Marina Avenue and Casa Grande Road, which is included in the City's Bicycle and Pedestrian Plan. All work associated with constructing this pathway would occur within the force main's work area.

Environmental Science Associates (ESA) biologists conducted a biological reconnaissance survey of the 2.35-mile alignment of the proposed PIPS Force Main Project (project) located in Petaluma, California (**Figure 1**). This report presents the findings of the biological reconnaissance survey and database searches conducted to identify the potential for the project area to support special-status plant and wildlife species, their habitat, sensitive natural communities, and State- and federally-regulated wetlands and waters. The intent and scope of this document is to characterize biological resources in the project area and characterize biological resources constraints that may affect project construction, and provide recommendations to avoid and minimize potential impacts to sensitive resources.

The biological "study area" includes the 2.35-mile project alignment and a 75-foot buffer area on either side of the alignment in which biological resources were characterized. This buffer was expanded to 100 feet on either side of the project alignment in the segment where the multi-use path would be. Previous geotechnical and historical resources studies for the alignment were also reviewed prior to the preparation of this report.



SOURCE: ESA, 2022

Petaluma PIPS Parallel Force Main Project

Figure 1
Project Location

ESA

1.2 Survey Methodology

1.2.1 Survey Dates and Surveying Personnel

ESA biologist Liza Ryan conducted a reconnaissance-level survey of the project alignment on August 2, 2022 from 11 A.M. to 2:30 P.M. Conditions were hot (80°F) and sunny, with minimal overhead clouds and good visibility conditions. The survey was conducted to characterize vegetation communities and to evaluate the study area for potential to support special-status wildlife and plant species, and assess the potential presence of sensitive natural communities and State- and federally-regulated wetlands and waters. On June 14, 2023 an aquatic resources delineation was conducted by botanist Nicole Ibanez and biologist Liza Ryan from 8:30 A.M. to 3 P.M. throughout the study area. Wetlands and waters within the designated alignment and buffer zone were mapped and habitat areas were re-evaluated in areas where the alignment had shifted.

The alignment was surveyed for rare plant and wildlife habitat by walking along the alignment (determined by Google Earth kmz) wherever possible, and visually surveying areas which were impassable, for complete search coverage. Adjacent areas were visually surveyed with binoculars where possible. Habitat types, common or special-status wildlife species observed were noted, along with the potential presence of wetlands and waters, sensitive natural communities, and suitable habitat for special-status wildlife species.

1.3 Review of Background Information

Prior to conducting the reconnaissance-level survey, ESA reviewed publicly available data and subscription-based biological resource data. No previous biology survey reports were available for the project alignment.

Data sources that assisted in this analysis include:

- U.S. Geological Survey (USGS) 7.5-minute topographic maps (*Petaluma Creek* and surrounding 8 quadrangles)
- Historic and current aerial imagery (Google 2022)
- California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB) (CDFW 2022a) and Natural Communities List (CDFW 2022b)
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS 2022); and
- USFWS Information for Planning and Consultation (IPac) Species List (USFWS 2022a).
- National Wetlands Inventory database (USFWS 2022b)

1.4 Property Location and Land Use

The project alignment is located in the City of Petaluma in southern Sonoma County, in the *Petaluma Creek* U.S. Geological Survey 7.5-minute quadrangle. It runs from west of U.S. Highway 101 by the Courtyard by Marriott Petaluma Sonoma County hotel eastward under the highway and across the Sonoma-Marin Area Rail Transit (SMART) tracks, across McDowell Creek where it exits the culvert underneath Lakeville Highway, through the parking lot of the Sheraton Sonoma Wine Country Petaluma hotel, across Adobe Creek, and along the northern edge of Shollenberger Park to its terminus in the Shollenberger Park Extension near the Ellis Creek Water Recycling Facility (Figure 1). The study area encompasses the project alignment, which is approximately 2.35 miles in length, and a 150-foot buffer (i.e., 75 feet out on each side of the pipeline alignment). In the segment which would include the proposed multi-use path, the buffer was increased to 100 feet on each side of the alignment. Land uses in the surrounding area consist of hotels, residences, highway and railroad, surface streets, commercial buildings, and recreational areas.

The new pipeline would be constructed parallel to the existing force main pipeline with a 10- to 20-foot offset, except for a segment along Technology Drive. The existing pipeline was constructed adjacent to wetland and riparian habitats across approximately 1.0 mile of its length. The 2,100-foot multi-use path between Marina Avenue and Casa Grande Road would be constructed within the force main's work area.

CHAPTER 2
Environmental Setting

This chapter provides the environmental baseline for wetlands and waters of the State and U.S., natural communities and habitats, and special-status plant and wildlife species along the project alignment.

2.1 Alignment Description and Characteristics

The study area refers to the 2.35-mile project alignment that is under consideration for development plus a 150-foot buffer (75 feet on each side) to consider potential indirect effects (e.g., noise, light, dust, vibration) on sensitive biological resources. In the segment which would include the proposed multi-use path, the buffer was increased to 100 feet on each side of the alignment. The study area consists primarily of disturbed lands (including roads, paths, buildings and parking lots), non-native grassland, and patches of riparian woodland and freshwater marsh habitat.

The study area is located in the Bay Area-Delta Bioregion[1], which supports numerous microclimates, topographic variation, and resulting specialized species that capitalize on these unique conditions. The area supports non-native annual grassland and ruderal plant species, as well as small areas of wetland along the creek and perimeter of Shollenberger Park. The area has a Mediterranean climate with dry, hot summers and cool, wet winters. Topographically, the area is relatively flat with elevation up to approximately 40 feet above mean sea level. Runoff from the alignment flows into Adobe Creek and Shollenberger Park, and on to the Petaluma River.

2.2 Natural Communities and Associated Wildlife

Natural communities are assemblages of plant species that occur together in the same area and are defined by species composition and relative abundance. The natural community classification is based on field observations, and the standard list of California Terrestrial Natural Communities recognized by the California Natural Diversity Database (Holland 1986). **Figure 2(a-e)** shows habitat types present in the study area. Developed/disturbed land is also present, but is not considered a vegetation community. Habitat types identified within the study area include non-native annual grassland, riparian woodland, seasonal wetland and freshwater marsh. Within

1 A bioregion is an area defined by a combination of ecological, geographic, and social criteria and consists of a system of related interconnected ecosystems. The Bay-Delta bioregion is considered the immediate watershed of the Bay Area and the Delta, not including the major rivers that flow into the Delta. It is bounded on the north by the northern edge of Sonoma and Napa Counties and the Delta and extends east to the edge of the valley floor; on the south, it is bounded by the southern edge of San Joaquin County, the eastern edge of the Diablo Range, and the southern edge of Santa Clara and San Mateo Counties.

slough with tidal marshlands along its sides. Brackish and tidal marshlands do not overlap the alignment, but sensitive species inhabiting these areas may be influenced by construction along the alignment, if present. Representative photos of the alignment are provided in **Appendix B**. Sensitive communities along the alignment include riparian woodland and freshwater marsh.

2.2.1 Non-Native Annual Grassland

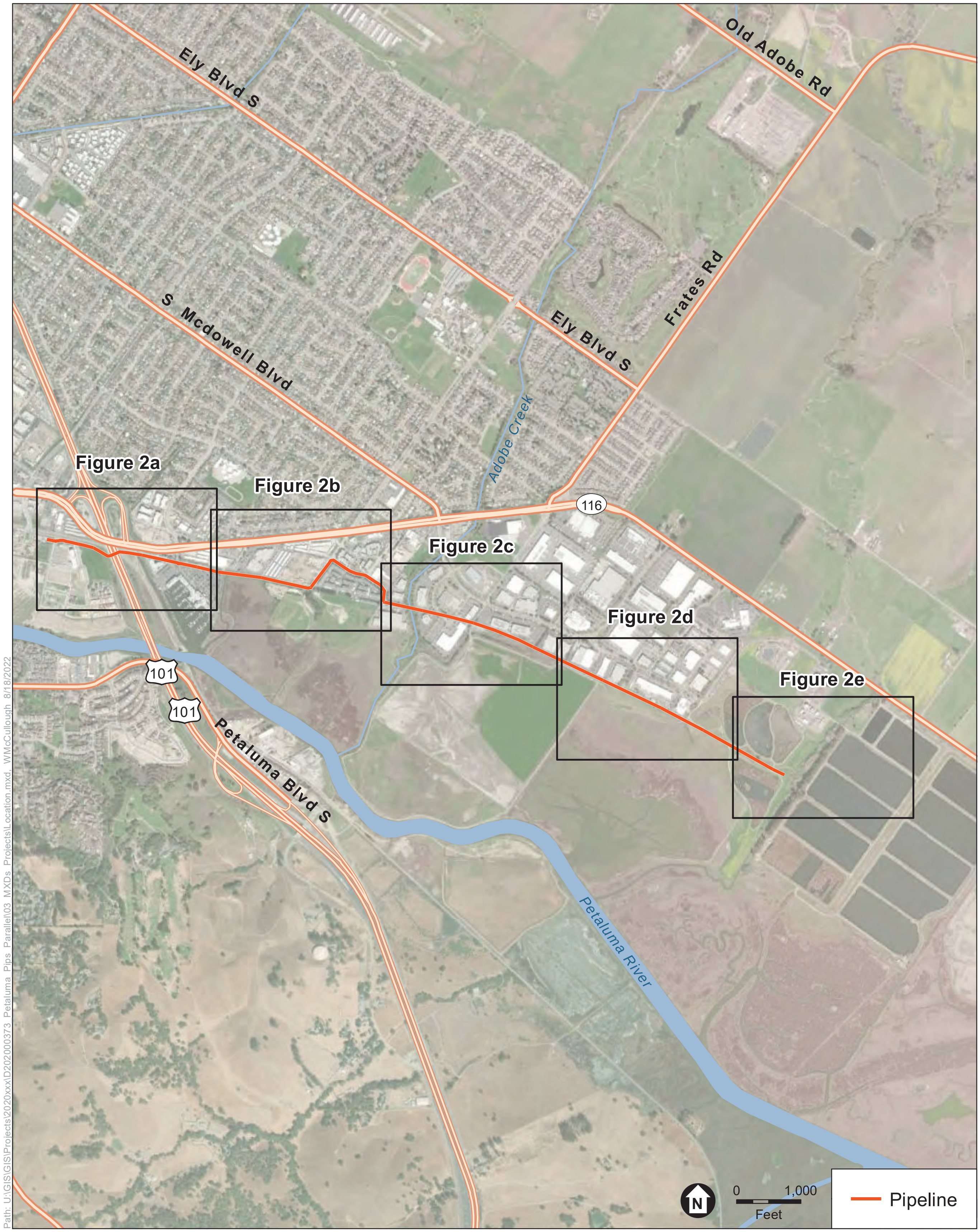
Non-native grassland is not considered a sensitive natural community. This vegetation community is dominated by introduced grasses and forbs, with interspersions of weedy species commonly associated with a ruderal community. Annual grassland may provide little cover for wildlife, yet many species forage and breed in this habitat. Grasslands may attract common reptiles such as western fence lizard (*Sceloporus occidentalis*), California alligator lizard (*Elgaria multicarinata*), and common garter snake (*Thamnophis sirtalis*). Bird species that nest in grasslands include northern harrier (*Circus hudsonius*), western meadowlark (*Sturnella neglecta*), and California horned lark (*Eremophila alpestris*). Birds that commonly forage in grasslands include turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and white-tailed kite (*Elanus leucurus*). Common small mammals may include western harvest mouse (*Reithrodontomys megalotis*), California ground squirrel (*Otospermophilus beecheyi*), and California vole (*Microtus californicus*). Larger mammal species such as black-tailed deer (*Odocoileus hemionus columbianus*), coyote (*Canis latrans*), and red fox (*Vulpes vulpes*) may forage in undisked grasslands where large patches are present.

Grassland in the alignment supports mainly non-native plants, including Himalayan blackberry (*Rubus armeniacus)*, yellow-star thistle (*Centaurea solstitialis*) and brome grasses (*Bromus* sp.). Ornamental shrubs and trees are also present in parking lots and along streets and pathways.

2.2.2 Riparian Woodland

Riparian woodland occurs along Adobe Creek where the alignment crosses (see Figure 2c). The overstory trees include California bay laurel (*Umbellularia californica*), California live oak (*Quercus agrifolia),* willow (*Salix* sp.), valley oak (*Quercus lobata)* and big-leaf maple (*Acer macrophyllum*). The understory vegetation includes non-native grasses, and other, primarily non-native, plants including Himalayan blackberry, fennel (*Foeniculum vulgare*), Italian thistle (*Carduus pycnocephalus*), and English ivy (*Hedera helix*).

Wildlife species common to riparian woodland include Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), warbling vireo (*Vireo gilvus*), Bewick's wren (*Thryomanes bewickii*), northern flicker (*Colaptes auratus*), orange-crowned warbler (*Oreothlypis celata*), black phoebe (*Sayornis nigricans*), red-shouldered hawk (*Buteo lineatus*), and belted kingfisher (*Megaceryle alcyon*). Common and special-status bats may also roost in tree cavities or beneath the bark of mature trees. Terrestrial mammals such as deer mouse (*Peromyscus* sp.), may also reside in the woodland understory.

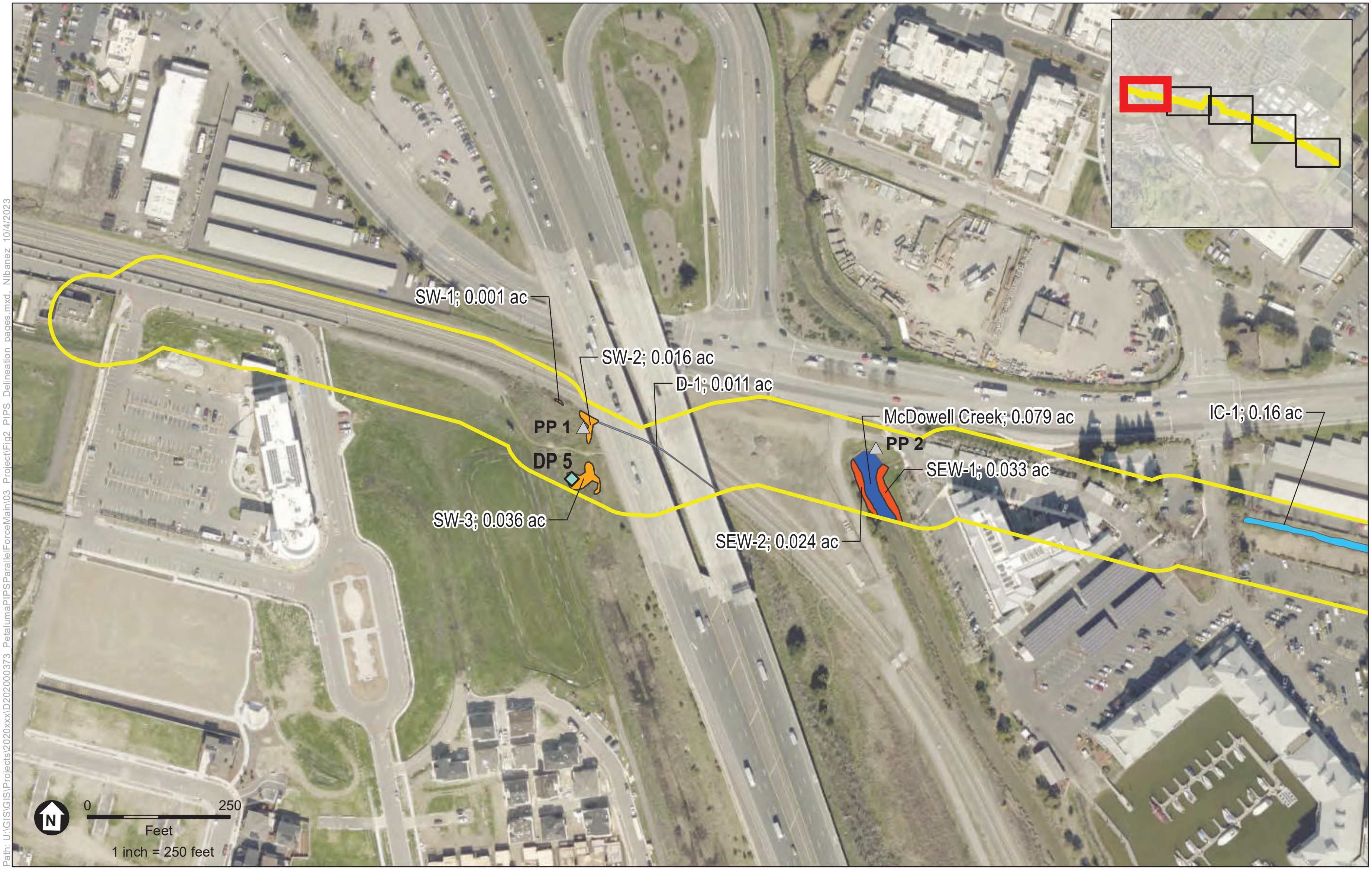


SOURCE: ESA, 2022

Petaluma PIPS Parallel Force Main Project

Figure 1
Project Location

ESA



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SOURCE: ESA, 2023

Petaluma PIPS Parallel Force Main Project

Survey Area
Culvert
Photo points (PP)
Riparian (0.27 ac)

Data Points (DP)
Upland
Wetland

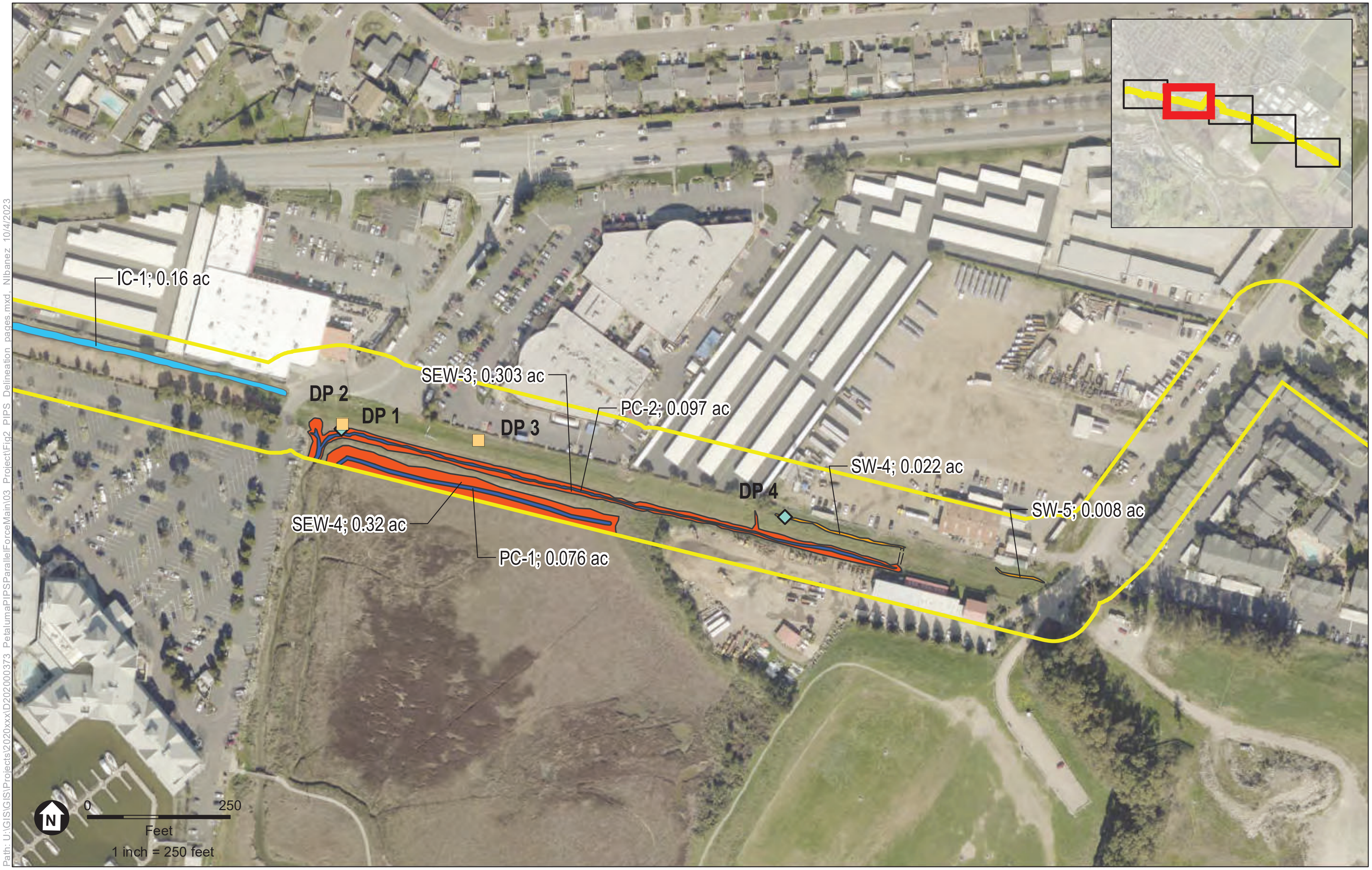
Wetlands (2.43 ac)
Freshwater Emergent Wetland (FEW; 1.08 ac)
Saline Emergent Wetland (SEW; 0.68 ac)
Seasonal Wetland (SW; 0.67 ac)

Other Waters (2.09 ac)
Ditch (D; 0.01 ac)
Ephemeral Channel (EC; 0.05 ac)
Intermittent Channel (IC; 0.62 ac)
Perennial Channel (PC; 0.25 ac)
Perennial Pond (0.52 ac)
Seasonal Pond (SP; 0.64 ac)

Figure 2a
Aquatic Resources Map
(1 of 5)

Coordinate System: State Plane California Zone II (US Feet)
Projection: Lambert Conformal Conic
Datum: NAD 1983 (2011)

Delineated by: Nicole Ibañez
Mapping by: Nicole Ibañez
Created on: 7/21/2023



SOURCE: ESA, 2023

Petaluma PIPS Parallel Force Main Project

Survey Area
Culvert
Photo points (PP)
Riparian (0.27 ac)

Data Points (DP)
Upland
Wetland

Wetlands (2.43 ac)
Freshwater Emergent Wetland (FEW; 1.08 ac)
Saline Emergent Wetland (SEW; 0.68 ac)
Seasonal Wetland (SW; 0.67 ac)

Other Waters (2.09 ac)
Ditch (D; 0.01 ac)
Ephemeral Channel (EC; 0.05 ac)
Intermittent Channel (IC; 0.62 ac)
Perennial Channel (PC; 0.25 ac)
Perennial Pond (0.52 ac)
Seasonal Pond (SP; 0.64 ac)

Figure 2b
Aquatic Resources Map
(2 of 5)

Coordinate System: State Plane California Zone II (US Feet)
Projection: Lambert Conformal Conic
Datum: NAD 1983 (2011)

Delineated by: Nicole Ibañez
Mapping by: Nicole Ibañez
Created on: 7/21/2023

Path: U:\GIS\GIS\Projects\2020xxx\D202000373_PetalumaPIPSParallelForceMain\03_Project\Fig2_PIPS_Delineation_pages.mxd, NIbanez 10/4/2023

SOURCE: ESA, 2023

Petaluma PIPS Parallel Force Main Project

Survey Area
Culvert
Photo points (PP)
Riparian (0.27 ac)

Data Points (DP)
Upland
Wetland

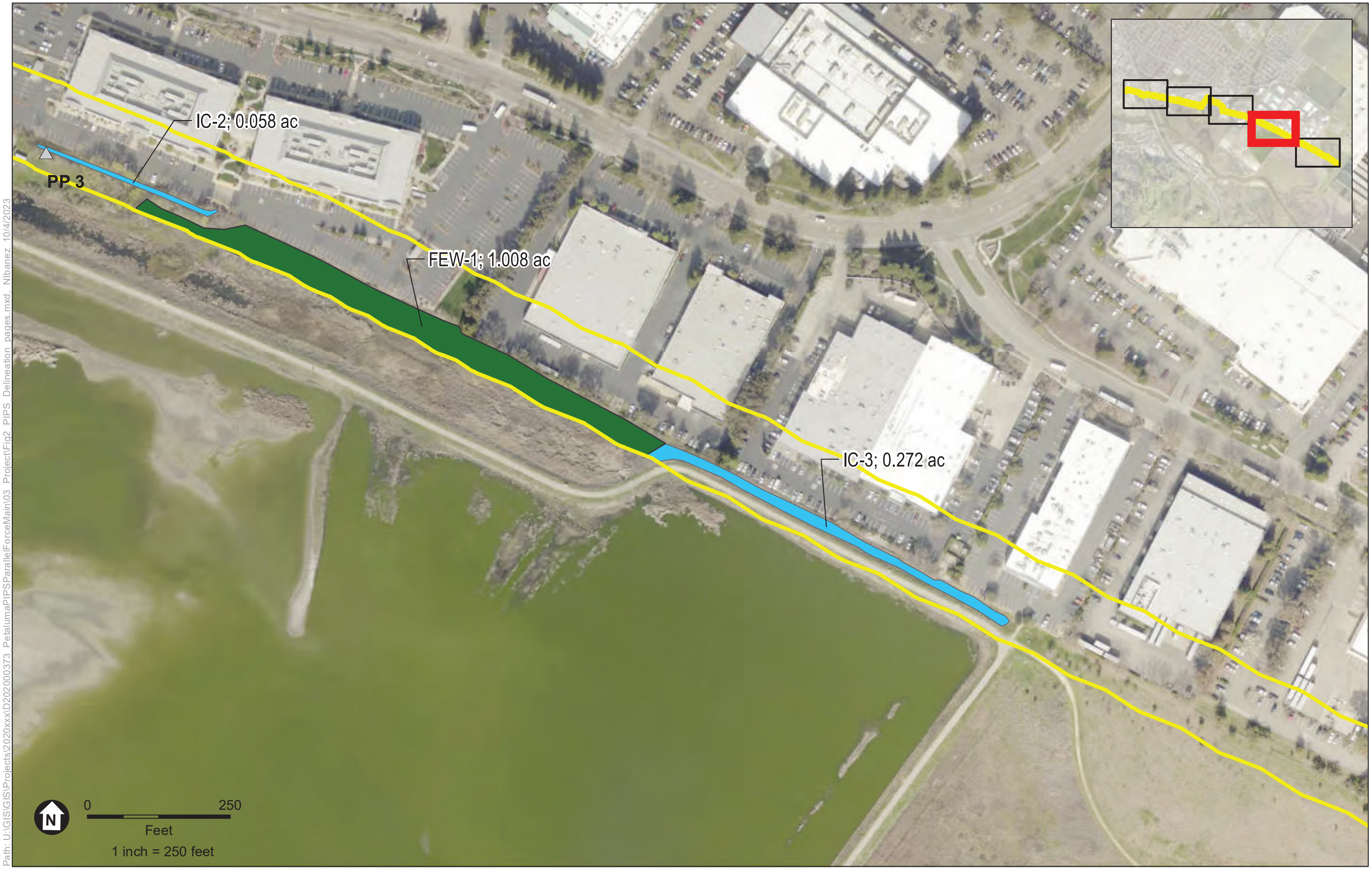
Wetlands (2.43 ac)
Freshwater Emergent Wetland (FEW; 1.08 ac)
Saline Emergent Wetland (SEW; 0.68 ac)
Seasonal Wetland (SW; 0.67 ac)

Other Waters (2.09 ac)
Ditch (D; 0.01 ac)
Ephemeral Channel (EC; 0.05 ac)
Intermittent Channel (IC; 0.62 ac)
Perennial Channel (PC; 0.25 ac)
Perennial Pond (0.52 ac)
Seasonal Pond (SP; 0.64 ac)

Figure 2c
Aquatic Resources Map
(3 of 5)

Coordinate System: State Plane California Zone II (US Feet)
Projection: Lambert Conformal Conic
Datum: NAD 1983 (2011)

Delineated by: Nicole Ibañez
Mapping by: Nicole Ibañez
Created on: 7/21/2023



Path: U:\GIS\GIS\Projects\2020xxx\D202000373_PetalumaPIPSParallelForceMain\03_Project\Fig2_PIPS_Delineation_pages.mxd, NIbanez 10/4/2023

SOURCE: ESA, 2023

Petaluma PIPS Parallel Force Main Project

Figure 2d
Aquatic Resources Map
(4 of 5)

Survey Area
Culvert
Photo points (PP)
Riparian (0.27 ac)

Data Points (DP)
Upland
Wetland

Wetlands (2.43 ac)
Freshwater Emergent Wetland (FEW; 1.08 ac)
Saline Emergent Wetland (SEW; 0.68 ac)
Seasonal Wetland (SW; 0.67 ac)

Other Waters (2.09 ac)
Ditch (D; 0.01 ac)
Ephemeral Channel (EC; 0.05 ac)
Intermittent Channel (IC; 0.62 ac)
Perennial Channel (PC; 0.25 ac)
Perennial Pond (0.52 ac)
Seasonal Pond (SP; 0.64 ac)

Coordinate System: State Plane California Zone II (US Feet)
Projection: Lambert Conformal Conic
Datum: NAD 1983 (2011)

Delineated by: Nicole Ibañez
Mapping by: Nicole Ibañez
Created on: 7/21/2023

SOURCE: ESA, 2023

Petaluma PIPS Parallel Force Main Project

Survey Area
Culvert
Photo points (PP)
Riparian (0.27 ac)

Data Points (DP)
Upland
Wetland

Wetlands (2.43 ac)
Freshwater Emergent Wetland (FEW; 1.08 ac)
Saline Emergent Wetland (SEW; 0.68 ac)
Seasonal Wetland (SW; 0.67 ac)

Other Waters (2.09 ac)
Ditch (D; 0.01 ac)
Ephemeral Channel (EC; 0.05 ac)
Intermittent Channel (IC; 0.62 ac)
Perennial Channel (PC; 0.25 ac)
Perennial Pond (0.52 ac)
Seasonal Pond (SP; 0.64 ac)

Figure 2e
Aquatic Resources Map
(5 of 5)

Coordinate System: State Plane California Zone II (US Feet)
Projection: Lambert Conformal Conic
Datum: NAD 1983 (2011)

Delineated by: Nicole Ibañez
Mapping by: Nicole Ibañez
Created on: 7/21/2023

2.2.3 Freshwater Marsh

Within Shollenberger Park, instream freshwater marsh containing primarily cattail (*Typha latifolia)* as well as bulrush (*Schoenoplectus californicus)* is present in the channel along the northern side of the park. The creek then enters a culvert, and marsh habitat is again present where it emerges (see Figure 2c). These wetlands are classified as *Freshwater Emergent Wetlands* according to the Cowardin classification system (Cowardin et al., 1979). These are areas that become inundated during the winter storm flows, dry out by summer, and support facultative (or wetter) herbaceous plants (ESA 2023).

Freshwater wetlands provide habitat to animals including raccoon, muskrat, beaver, Pacific chorus frog (*Pseudacris regilla)*, and western pond turtle (*Emys marmorata*), and support numerous bird species, such as marsh wren (*Cistothorus palustris*), saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), song sparrow, black rail, mallard (*Anas platyrhynchos*), and raptors such as northern harrier.

2.2.4 Seasonal Wetland

Seasonal wetlands occur throughout the study area where water ponds for long enough to support hydrophytic vegetation in swales and depressions. These features are classified as *Palustrine, Emergent, Persistent, Seasonally Flooded* (Cowardin, 1979). They are primarily freshwater features fed by rainwater and runoff. Figure 2 shows seasonal wetlands south of the railroad, in swales within annual grassland south of developed areas, and in a depression southwest of the wastewater treatment ponds. These wetlands have hydric soils, are seasonally flooded, and are dominated by hydrophytic vegetation such as fat-hen (*Atriplex prostrata*), cocklebur (*Xanthium strumarium*), nutsedge (*Cyperus eragrostis*), bristly ox tongue (*Helminthotheca echioides*), italian rye grass and annual beard grass (*Polypogon monspeliensis*). Seasonal wetlands may host a variety of nesting birds, reptiles and small mammals, similar to grassland and riparian habitats.

2.3 Wetlands and Waters

Much of Shollenberger Park is an open water lake, with freshwater emergent wetland, freshwater ponds, and estuarine (brackish) wetlands also present. The ECWRF is a series of created polishing ponds, and Petaluma Marsh is primarily estuarine wetland. Adobe Creek is a freshwater channel tributary to the Petaluma River, while McDowell Creek along the alignment is a tidally-influenced brackish channel with fringing tidal marsh vegetation.

The PIPS Aquatic Delineation Report (ESA 2023) identifies approximately 2.4 acres of wetlands and 2.1 acres of waters within the study area (Figure 2a-e). Wetland types identified included Freshwater Emergent Wetland (1.08 ac), Saline Emergent Wetland (0.68 ac), and Seasonal Wetland (0.67 ac). Waters include Intermittent Channel (0.49 ac); Perennial Channel (0.38 ac); Perennial Pond (0.52 ac); Seasonal Pond (0.64 ac); Ephemeral Channel (0.05 ac); and Ditch (0.01 ac). The ponds are located at the eastern end of the alignment on ECWRF lands. Crossing Shollenberger Park, the alignment contains an intermittent channel and freshwater emergent wetland within its study area buffer. The multi-use path route contains a drainage channel with saline wetland along its sides, and two small seasonal wetlands. Estuarine and seasonal wetlands are also present at the western end of the alignment.

2.4 Special-Status Species

Several species known to occur in the vicinity of the alignment are protected pursuant to federal and/or state endangered species laws, or have been designated as Species of Special Concern by CDFW. In addition, Section 15380(b) of the *CEQA Guidelines* provides a definition of rare, endangered, or threatened species that are not included in any listing. Species recognized under these terms are collectively referred to as "special-status species."

A list of special-status species with potential to occur in or near the project alignment was compiled from a nine-quad search of the California Natural Diversity Database (CNDDB) (CDFW 2022a) centered on the USGS 7.5-minute quad Petaluma River; a nine-quad search on the California Native Plant Society's (CNPS) Rare Plant Inventory (CNPS 2022); and a search of the U.S. Fish and Wildlife Service IPaC database (USFWS 2022a). The full list of species was then individually assessed based on habitat requirements and distribution relative to vegetation community that occur in and around the project alignment as well as the observations made during the reconnaissance survey. The list of special-status plant and wildlife species that were considered in the analysis is provided in **Appendix A**. Species present or having a moderate or high potential to occur in the alignment are described below in greater detail.

One special-status species, San Pablo song sparrow, was observed during the biological reconnaissance survey. Suitable habitat for the song sparrow, saltmarsh common yellowthroat, and other marsh birds was observed within the cattail marshlands, and suitable habitat for bats was present in the riparian woodland along Adobe Creek. Other wildlife species observed during the survey included mourning dove (*Zenaida macroura*), dark-eyed junco (*Junco hyemalis*), American crow (*Corvus brachyrhynchos*), and turkey vulture.

2.4.1 Special-Status Plants

Special-status plants that were considered for the project are identified in Appendix A. The majority of the alignment consists of non-native grassland and disturbed land (e.g., parking lots). The fragmentary riparian and marsh habitats along the alignment have been subject to human disturbance and hydrological changes over the years. As a result, habitat for special-status plant species is poor quality and none of these plants is likely to occur along the alignment. Farther out in Shollenberger Park is potential habitat for special-status plants such as Point Reyes bird's beak (*Chloropyron maritimum* ssp. *palustre*), but no special-status plants have been observed, nor are expected to occur, along the alignment or within the buffer.

2.4.2 Special-Status Wildlife

Several special-status wildlife species were determined to have a moderate or higher potential to occur in the vicinity of the alignment: steelhead, California red-legged frog, foothill yellow-legged frog, western pond turtle, white-tailed kite, San Pablo song sparrow, saltmarsh common yellowthroat, California Ridgway's rail, California black rail, Townsend's big-eared bat, and hoary bat, and salt marsh harvest mouse are moderately likely to occur within suitable habitat in Shollenberger Park and Petaluma Marsh in the vicinity of the study area. These species are considered below.

Steelhead (*Oncorhynchus mykiss irideus*)

The Central California Coast steelhead DPS is federally listed as threatened. This DPS includes those fish found in coastal river basins from the Russian River south to Soquel and Aptos Creek, California, and the drainages of San Francisco Bay and San Pablo Bay, including the Napa River. Steelhead have a highly flexible life history and may follow a variety of life-history patterns; they may be residents (non-migratory, often referred to as “rainbow trout”) or may migrate to the open ocean (anadromous). Adult steelhead lay eggs and juveniles rear in freshwater until they become large enough to migrate to the ocean. Steelhead select spawning sites that contain gravel substrate and have sufficient flow velocity to maintain circulation through the gravel and provide a clean, well-oxygenated environment for incubating eggs. Steelhead fry generally rear in edgewater habitats and move gradually into pools and riffles as they grow larger. Cover is an important habitat component for juvenile steelhead, both as a velocity refuge and as a means of avoiding predation. Steelhead are seasonally present in the lower portions of Adobe Creek, including where the alignment would cross. Adobe Creek is designated critical habitat for steelhead, but the species would only be present during winter months when the channel is flowing.

California red-legged frog (*Rana draytonii*)

The California red-legged frog is federally listed as a threatened species throughout its range in California and is a CDFW Species of Special Concern (SSC). This frog historically occurred over much of the state from the Sierra Nevada foothills to the coast and from Mendocino County to the Mexican border. California red-legged frog typically breed in ponds, slow-moving creeks, and streams with deep pools that are lined with dense emergent marsh or shrubby riparian vegetation. In summer (non-breeding season), California red-legged frogs are likely to be observed near a deep pool in a creek or a pond, where emergent vegetation, semi-submerged root masses and undercut banks provide protection from predators (USFWS 2005). They use upland habitat such as open grasslands for foraging and dispersal. Prey items include invertebrates and small vertebrates. Suitable upland habitat includes moist seeps or springs, burrows or moist debris piles for dispersal and aestivation. Factors that have contributed to the decline of this species include destruction of riparian habitat from development, agriculture, flood control practices, or the introduction of exotic predators such as American bullfrog (*Lithobates catesbeianus*). The nearest California red-legged frog observation to the alignment was made in 1994 in Ellis Creek near Petaluma Marsh, within 1.0-mile of the alignment. While California red-legged frogs are known to disperse up to 1.0-mile or more from suitable breeding ponds, there are no records of the species in Adobe Creek, and the waters at Shollenberger Park are often brackish and unsuitable for this species. There is moderate potential for California red-legged frog to disperse through the ECWRF area of the alignment during wetter periods, but the ponds in this area are perennial and support bullfrog (*Lithobates catesbeianus*), a predator and competitor species. Thus, California red-legged frog are unlikely to colonize these ponds from their known habitat in nearby Ellis Creek.

Foothill yellow-legged frog *(Rana boylii)*

The Northwest/North Coast population of foothill yellow-legged frog is a CDFW species of special concern. Foothill yellow-legged frog inhabits partly-shaded, usually perennial, streams with rocky substrate, deep pools and shallow riffles, and sunny, sandy or rocky banks for basking. Breeding occurs between mid-March and early June. Foothill yellow-legged frogs attach eggs to available substrate in the stream bed, often stones or emergent vegetation such as sedges. Frog larvae need at least 15 weeks to attain metamorphosis, which lasts a few days and during which metamorphs are concentrated in great numbers along the shore of the stream. Conservation threats include damming of rivers or otherwise reducing spring water flows and/or periodic water releases during the breeding season, which shears eggs from their attachment site and washes them or newly hatched larvae downstream. The nearest observation of this species is upstream in Adobe Creek in 2019, approximately ½-mile from the alignment crossing. Though the creek does not have suitable habitat for this species at the alignment crossing, it has moderate potential to occur in the area during wet times of year; it is unlikely to occur when the creek is dry.

Western pond turtle (*Emys marmorata*)

Western pond turtle is a CDFW Species of Special Concern. This species is normally associated with permanent ponds, lakes, streams, irrigation ditches, or permanent pools along intermittent streams and requires basking sites and suitable upland habitat, such as sandy banks, for egg laying. This species can tolerate full-strength seawater for a short period of time, but normally is found in freshwater. Western pond turtle was recorded in Ellis Creek in 2007 and in Shollenberger Park in 2008; adults were observed basking on woody debris. This species has high potential to occur along the alignment in Shollenberger or Ellis Creek segments where water channels, ponds, woody debris, or other basking sites are present. Nearby grassland habitat could also provide marginal nesting habitat for this species.

Ridgway's rail and California black rail (*Rallus obsoletus* and *Laterallus jamaicensis coturniculus*)

Ridgway's and California black rail are secretive birds difficult to observe in dense marsh vegetation; they prefer to run and hide rather than fly from threats. Ridgway's rail maintains large home ranges in tidal and brackish marshes, and has high site fidelity. Ridgway's rails occur within a range of tidal and brackish marshes; the qualities of a marsh strongly influence the density of rail population it can support. Physical habitat characteristics positively correlated to California clapper rail presence include large marsh size, proximity to other marshes, presence of high tide refugia, presence of buffers or transitional zones between marshes and upland areas, diverse marsh elevations, and intricate channel networks (USFWS 2013).

California black rail may inhabit saltwater, brackish, and freshwater marshes. Vegetation of occupied marshes varies from almost pure pickleweed to sedges, saltgrass, bulrush and cattails; it prefers saturated ground in shallow marsh for nesting. Black rail and Ridgway's rail have been recorded numerous times in the past 10 to 15 years in marshes along the Petaluma River and in San Pablo Bay. The closest black rail record is in Petaluma Marsh within 1,000 feet of the alignment in 2015, within Shollenberger Park (CDFW 2022). Ridgway's rail's closest record was in 2014 in the Petaluma Marsh adjacent to Shollenberger Park, north of the Petaluma River (CDFW 2022). This location is within 1/4-mile of the alignment and overlaps the recorded location for black rail; while these species would not occur on the alignment itself, both species are assumed to be present in the marshes south of the alignment, east of U.S. Highway 101.

Breeding and migratory birds

The riparian woodland, freshwater marsh and grassland communities along the alignment may provide nesting and foraging habitat for a variety of resident and migratory birds in mature trees, dense shrubs, or in tall weedy plants on the ground. Raptors which may nest in riparian trees include white-tailed kite, a California Fully Protected species. Cooper's hawk and sharp-shinned hawk, raptors on the federal Watch List, may also occur in riparian habitats. In addition, red-shouldered hawk, western screech owl, and great horned owl (*Bubo virginianus*) may nest in these areas, while passerine species could include Anna's hummingbird (*Calypte anna*), Bewick's wren, American robin (*Turdus migratorius*), American crow, spotted towhee (*Pipilo maculatus*), dark-eyed junco and western meadowlark, among others. The federal Migratory Bird Treaty Act (MBTA) and California Fish and Game Code protect nesting raptors and native migratory birds that could occur along the alignment and/or in the vicinity.

Birds such as San Pablo song sparrow, marsh wren and salt marsh common yellowthroat, may nest in the low and high marsh, along with shorebirds and waterbirds, including dabbling ducks, that would also use adjacent lowland grassland habitats.

Bat species

Bats are likely to forage over grassland and marsh habitats, and may roost overnight in tree cavities or underneath bark. Two special-status bats, Townsend's big-eared bat (*Corynorhinus townsendii*) and hoary bat (*Lasiurus cinereus*) are moderately likely to occur, along with common bat species such as *Myotis* bats. Bats would be most likely to roost in coast live oak trees within the riparian woodland surrounding Adobe Creek.

Salt marsh harvest mouse

The salt marsh harvest mouse is a small rodent in the family Muridae, morphologically similar to the more widespread western harvest mouse (*Reithrodontomys megalotis*). As described in the species' Recovery Plan (USFWS 2013), the fringing tidal marshes along northern San Pablo Bay (Petaluma River to Mare Island Strait) support the largest population of the northern subspecies of salt marsh harvest mice in San Pablo Bay. Salt marsh harvest mice commonly occur in the upper portions of tidal marshes where terrestrial grasses are absent or remote. However, salt marsh harvest mice frequently utilize terrestrial grassland habitats adjacent to tidal marsh and grass-pickleweed ecotones. Salt marsh harvest mice are typically associated with tall, dense, continuous stands of pickleweed, but may also be found in upper marsh stands of other vegetation. Salt marsh harvest mouse has been recorded in Petaluma Marsh (1990) along the Petaluma River (CDFW 2022), but would not be expected along the alignment itself, which is approximately 500 feet from tidal marsh habitat.

2.5 Critical Habitat for Federally-Listed Species

The USFWS defines critical habitat in the federal Endangered Species Act as a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species that may require special management and protection. Adobe Creek within the project alignment is critical habitat for Central California Coast steelhead (70 FR 52487; 2005); however, steelhead are not present within the creek in summer when the creek is dry. The alignment is not within designated critical habitat for any terrestrial federally-listed plant or wildlife species.

CHAPTER 3
Regulatory Context

3.1 Federal

3.1.1 Endangered Species Act of 1973, as amended (16 U.S.C. §§1531-1543)

The federal Endangered Species Act (FESA) and subsequent amendments provide guidance for the conservation of endangered and threatened species and the ecosystems upon which they depend. In addition, the FESA defines species as threatened or endangered and provides regulatory protection for listed species. The FESA also provides a program for the conservation and recovery of threatened and endangered species as well as the conservation of designated critical habitat that USFWS determines is required for the survival and recovery of these listed species.

Section 9 lists those actions that are prohibited under the FESA. The definition of "take" includes to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Section 9 prohibits take of listed species of fish, wildlife, and plants without special exemption. Section 7 requires the presence of a federal nexus with a federal agency other than USFWS (e.g., federal funding, federally regulated waters of the U.S.) and allows USFWS and the other federal agency to authorize, fund, or execute actions that do not jeopardize the existence of federally-listed species or adversely modify designated critical habitat. Through this regulatory mechanism, the involved federal agencies evaluate potential impacts on regulated resources and may allow for take of listed species or habitat. Section 10 provides a means whereby a nonfederal action with the potential to result in take of a listed species can be allowed under a recovery and interstate commerce permit, incidental take permit pursuant to a habitat conservation plan (HCP), or enhancement of survival permit (e.g., safe harbor agreement).

3.1.2 Migratory Bird Treaty Act MBTA (16 U.S.C. §§703-711)

The Migratory Bird Treaty Act (MBTA) of 1918 is the domestic law that affirms and implements a commitment by the U.S. to four international conventions (with Canada, Mexico, Japan, and Russia) for the protection of a shared migratory bird resource. Unless and except as permitted by regulations, the MBTA makes it unlawful at any time, by any means, or in any manner to intentionally pursue, hunt, take, capture, or kill migratory birds anywhere in the United States. The law also applies to disturbance and removal of nests occupied by migratory birds or their eggs during the breeding season, whether intentional or incidental.

3.1.3 Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. §668)

The federal Bald and Golden Eagle Protection Act of 1940 protects bald and golden eagles by prohibiting the taking, possession, and commerce of such birds and establishes civil penalties for violation of this act. Take of bald and golden eagles includes to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" (16 U.S.C. §668c). "Disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior (72 Fed. Reg. 31132; 50 CFR §22.3).

3.1.4 Clean Water Act, Section 404

The U.S. Army Corps of Engineers (USACE, or Corps) administers Section 404 of the Clean Water Act (CWA). Section 404 regulates activities in wetlands and "other waters of the United States." Wetlands are a subset of "waters of the United States" that are defined in the Code of Federal Regulations (CFR) (33 CFR 328.3[a]; 40 CFR 230.3[s]) as:

1. All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide.
2. All interstate waters including interstate wetlands. (Wetlands are defined by the federal government [33 CFR 328.3(b), 1991] as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances support, a prevalence of vegetation typically adapted for life in saturated soil conditions).
3. All other waters—such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds—the use, degradation, or destruction of which could affect interstate or foreign commerce. This includes any waters with the following current or potential uses:
    - That are or could be used by interstate or foreign travelers for recreational or other purposes,
    - From which fish or shellfish are or could be taken and sold in interstate or foreign commerce, or
    - That are used or could be used for industrial purposes by industries in interstate commerce.
4. All impoundments of waters otherwise defined as waters of the United States under the definition.
5. Tributaries of waters identified in paragraphs (1) through (4).
6. Territorial seas.
7. Wetlands next to waters identified in paragraphs (1) through (6).

8. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding the Clean Water Act jurisdiction remains with the U. S. Environmental Protection Agency (328.3[a][8] added 58 CFR 45035, August 25, 1993).

Impacts to federally regulated waters subject to the jurisdiction of the USACE would require a permit from the USACE.

3.2 State

3.2.1 California Endangered Species Act (Fish and Game Code §2050 et seq.)

The California Endangered Species Act (CESA) establishes the policy of the state to conserve, protect, restore, and enhance threatened or endangered species and their habitats. The CESA mandates that state agencies should not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. For projects that would affect a listed species under both the CESA and the FESA, compliance with the FESA would satisfy the CESA if CDFW determines that the federal incidental take authorization is "consistent" with the CESA under Fish and Game Code Section 2080.1. Before a project results in take of a species listed under the CESA, a take permit must be issued under Section 2081(b).

3.2.2 Fish and Game Code §§2080, 2081

Section 2080 of the Fish and Game Code states, "No person shall import into this state [California], export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the [California Fish and Game] Commission determines to be an endangered species or threatened species, or attempt any of those acts, except as otherwise provided in this chapter, or the Native Plant Protection Act, or the California Desert Native Plants Act." Pursuant to Section 2081, CDFW may authorize individuals or public agencies to import, export, take, or possess state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or Memoranda of Understanding, if the take is incidental to an otherwise lawful activity, impacts of the authorized take are minimized and fully mitigated, the permit is consistent with any regulations adopted pursuant to any recovery plan for the species, and the project operator ensures adequate funding to implement the measures required by CDFW. CDFW makes this determination based on available scientific information and considers the ability of the species to survive and reproduce.

3.2.3 Fish and Game Code §§3503, 3503.5, and 3513

Under these sections of the Fish and Game Code, a project operator is not allowed to conduct activities that would result in the taking, possessing, or destroying of any birds of prey; the taking or possessing of any migratory nongame bird; the taking, possessing, or needlessly destroying of the nest or eggs of any raptors or nongame birds; or the taking of any nongame bird pursuant to Fish and Game Code section 3800, whether intentional or incidental.

3.2.4 Fish and Game Code §§1600 - 1616

Sections 1600–1616 of the Fish and Game Code describe habitats potentially under the regulatory jurisdiction of CDFW. The Fish and Game Code section 1602 requires an entity to notify CDFW prior to commencing any activity that may (1) substantially divert or obstruct the natural flow of any river, stream or lake; (2) substantially change or use any material from the bed, channel or bank of any river, stream, or lake; or (3) deposit debris, waste or other materials that could pass into any river, stream or lake (CDFW 2018). A Lake and Streambed Alteration Agreement (LSAA) covers activities that would result in the modification of the bed, bank, or channel of a stream, river, or lake, including water diversion and damming and removal of vegetation from the floodplain to the landward extent of the riparian zone (the top-of-bank). It governs both activities that modify the physical characteristics of the stream and activities that may affect fish and wildlife resources that use the stream and surrounding habitat (i.e., the riparian vegetation or wetlands). A Section 1602 LSAA will often require mitigation, such as revegetation or replanting of riparian trees or other compensatory mitigation. for impacts to these resources.

3.2.5 Native Plant Protection Act (NPPA) (Fish and Game Code §§1900-1913)

California's NPPA requires all state agencies to use their authority to carry out programs to conserve endangered and rare native plants. Provisions of the NPPA prohibit the taking of endangered or rare plants from the wild and require notification of CDFW at least 10 days in advance of any change in land use in areas that support listed plants.

Vascular plants that are identified as "rare" by the CDFW, but which may have no designated status or protection under federal or State endangered species legislation, are defined as follows:

- **Rank 1A:** Plants Presumed Extinct.
- **Rank 1B:** Plants Rare, Threatened, or Endangered in California and elsewhere.
- **Rank 2:** Plants Rare, Threatened, or Endangered in California, but more numerous elsewhere.
- **Rank 3:** Plants about Which More Information is Needed – A Review List.
- **Rank 4:** Plants of Limited Distribution – A Watch List.

In general, plants appearing on CRPR 1A, 1B, or 2 are considered to meet the criteria of CEQA Guidelines Section 15380 and effects to these species are considered "significant". Additionally, plants identified as CRPR 1A, 1B or 2 meet the definition of Section 1901, Chapter 10 (Native Plant Protection Act) and Sections 2062 and 2067 (California Endangered Species Act) of the FGC.

3.2.6 Porter Cologne Water Quality Act

The State Water Resources Control Board (SWRCB), through its nine Regional Water Quality Control Boards (RWQCB), regulates waters of the State through the California Clean Water Act (i.e., Porter-Cologne Act). The RWQCB also administers permits for discharges into waterways under the Clean Water Act Section 401 Water Quality Certification and Wetlands Program.

If the Corps determines wetlands or other waters to be isolated waters and not subject to regulation under the federal CWA, the RWQCB may choose to exert jurisdiction over these waters under the Porter-Cologne Act as waters of the State.

3.2.7 CEQA Guidelines Section 15380

Although threatened and endangered species are protected by specific federal and State statutes, CEQA Guidelines Section 15380(b) provides that a species not listed on the federal or State list of protected species may be considered rare or endangered if the species can be shown to meet certain specific criteria. These criteria have been modeled after the definition of FESA and the section of Fish and Game Code discussing rare or endangered plants or animals. This section was included in the CEQA Guidelines primarily for situations in which a public agency is reviewing a project that may have a significant effect on a candidate species that has not yet been listed by CDFW or USFWS. CEQA provides the ability to protect species from potential project impacts until the respective agencies have the opportunity to designate the species protection.

CEQA also specifies the protection of other locally or regionally significant resources, including natural communities or habitats. Although natural communities do not presently have legal protection, CEQA requires an assessment of such communities and potential project impacts. Natural communities that are identified as sensitive in the CNDDB are considered by CDFW to be significant resources and fall under the CEQA Guidelines for addressing impacts. Local planning documents such as general and area plans often identify natural communities.

3.3 Local

3.3.1 City of Petaluma General Plan

The City of Petaluma General Plan 2025 identifies current and future needs in areas such as land use, housing, transportation, public services, environmental quality, and economic viability (City of Petaluma, 2012). The following goals and policies from the Petaluma General Plan are relevant to biological resources in the vicinity of the project alignment.

Goal 4-G-1: Biology & Natural Resources. Protect and enhance biological and natural resources within the UGB.

***Policies and Programs*:**

***4-P-1*:** Protect and enhance the Petaluma River and its tributaries through a comprehensive river management strategy of the following programs:

A. Fully adopt and incorporate the Goals, Objectives, Policies and Programs of the Petaluma River Access and Enhancement Plan as an integral part of the General Plan 2025. Implement the Petaluma River Access and Enhancement Plan including expanded improvements identified through project specific environmental assessment.

B. Institute and maintain public access to and along the entire length (on one or both sides), of the river while ensuring that natural resources and river dependent industry are protected.

C. Require design review to address the relationship and stewardship of that project to the river or creek for any development on sites with frontage along the river and creeks.

D. Create setbacks for all tributaries to the Petaluma River extending a minimum of 50 feet outward from the top of each bank, with extended buffers where significant habitat areas, vernal pools, or wetlands exist. Development shall not occur within this setback, except as part of greenway enhancement (for example, trails and bikeways). Where there is degradation within the zone, restoration of the natural creek channels and riparian vegetation is mandatory at time of adjacent development.

E. Facilitate compliance with Phase II standards of the National Pollutant Discharge Elimination System (NPDES) to improve the water quality and aesthetics of the river and creeks.

F. Work with the State Lands Commission, State Department of Fish and Game, the Sonoma County Water Agency, and other jurisdictional agencies on preservation/enhancement of the Petaluma River as a component of reviewing major development along the River.

G. Expand the planting and retention of trees along the upper banks of the river and creeks to reduce ambient water temperature and shade out invasive, non-native species.

H. Revise the Development Code to include:

- Standards for the four management zones that run the entire length of the river: 1) Restoration Zone, 2) Buffer Zone, 3) Preservation Zone, and 4) River Oriented Development Zone. These standards shall be based on the River Plan's text and sections A-A through O-O as augmented by the cross-section needs identified through the XP-SWMM analyses;
- Design review requirements as articulated in the River Plan for any development on sites with frontage along the river or within 300 ft. of the river;

I. Develop a consistent design for site furniture, a wayfinding system, and educational signage in the PRC and along the creeks and tributaries leading to it to heighten the recognition and value of the river and its ecosystem.

J. Utilize the Parks and Recreation, Water Resources & Conservation, Public Works departments, property owners (e.g., Landscape Assessment Districts) and/or other appropriate public agencies (e.g. Sonoma County Water Agency) to manage the long term operations, maintenance responsibilities, and stormwater capacity associated with the river and tributary greenways.

K. Prohibit placement of impervious surfaces in the Floodway (i.e., Parking lots, roadways, etc.) with the exception of pathways and emergency access improvements.

L. Continue to implement, where appropriate, flood terrace improvements to reduce localized flooding in concert with habitat enhancement projects.

M. Cooperate with State and Federal agencies to address and/or eradicate issues and environmental problems associated with possible infestation of the midden crab into the Petaluma River and adjacent tributaries.

***4-P-2*:** Conserve wildlife ecosystems and sensitive habitat areas in the following order of protection preference: 1) avoidance, 2) on-site mitigation, and 3) off-site mitigation.

A. Utilize Technical Memorandum 3: Biological Resources Review as a baseline document, expanding to address project specific impacts.

***4-P-3*:** Protect special status species and supporting habitats within Petaluma, including species that are State or Federal listed as endangered, threatened, or rare.

A. As part of the development review process, site-specific biological resource assessments may be required to consider the impacts on riparian and aquatic resources and the habitats they provide for invertebrates, fish, amphibians, reptiles, birds, mammals, and plants. If development is located outside these ecologically sensitive regions, no site-specific assessment of biological resources may be necessary. Appropriate mitigation measures to reduce impacts to sensitive habitats and special status species shall be imposed on a project-by-project basis according to Petaluma's environmental review process.

B. Permit mitigation banking as a conditional use in all land use designations along the Petaluma River and its tributaries.

Goal 8-G-10: Water Quality. Reduce pollutant load in surface water runoff, thereby improving water quality within the Petaluma River and its tributaries.

***Policies and Programs*:**

***8-P-38*:** All development activities shall be constructed and maintained in accordance with Phase 2 National Pollutant Discharge Elimination System (NPDES) permit requirements.

The Water Resources and Conservation Department shall review, and have the authority to conditionally approve, all development permits to insure compliance with NPDES Phase 2 requirements. Maintain, update as needed, and implement the City's Storm Water Management Plan to retain a current storm water discharge permit with the California Regional Water Quality Control Board.

A funding mechanism, such as a storm water utility fee, shall be implemented by the City to insure a dedicated source of funds is available for all surface water drainage system maintenance and improvement needs.

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CHAPTER 4
Recommended Avoidance and Minimization Measures

The following section describes recommended avoidance and minimization measures that would lessen the project's potential impact on protected biological resources. Where potentially necessary for project construction, pertinent regulatory permits are discussed below.

4.1 Wetlands and Riparian Woodland

Riparian woodland habitat is present in the study area at Adobe Creek (see Figure 2c), which will be crossed via microtunneling with access shafts well away from riparian habitat; fragments of freshwater marsh are present in the study area in Shollenberger Park; saline and seasonal wetlands are present near the western end of the alignment, and tidal marshland in McDowell Creek, which will also be crossed by microtunneling. For impacts from the pipeline or multi-use path to wetlands or waters, the City would be required to apply for a 401 Permit from the Regional Water Quality Control Board, and a 404 permit from the U.S. Army Corps of Engineers. For impacts to riparian habitat under CDFW jurisdiction, the City would be required to apply for a 1602 permit (Lake or Streambed Alteration Agreement). See Chapter 3 for more information. Note that the alignment does not fall under Bay Conservation and Development Commission (BCDC) jurisdiction; BCDC jurisdiction ends at the limit of tidal influence in Adobe Creek, which is downstream of the planned crossing.

To avoid or minimize impacts to sensitive natural communities, including wetlands, the City may implement the following measures:

- Wetlands, waters and riparian areas shall be avoided to the greatest extent feasible during project construction of the pipeline and multi-use path. Before construction begins, the Project engineer and a qualified biologist shall identify locations for equipment and personnel access and materials staging that will minimize riparian vegetation disturbance. When heavy equipment is required, unintentional soil compaction shall be minimized by using equipment with a greater reach, or using low-pressure equipment. Temporary impacts on sensitive natural communities, including wetlands, from construction of the pipeline and multi-use path shall be mitigated by revegetation with native species.

- Vegetation management activities will be limited to areas outside of marshland and riparian habitat to the greatest extent possible. For vegetation management activities adjacent to wetland or riparian habitat, the only herbicides to be used will be EPA-certified for use in/adjacent to aquatic environments.

- Following construction, the City shall prepare a Habitat Restoration and Monitoring Plan for restoration of any riparian or wetland impacts. The plan shall describe required salvage and replanting protocols prior to and after construction is complete and shall thereby reduce the long-term amount of losses of these natural communities. This plan shall include, but not be limited to, protocols for replanting of vegetation removed prior to or during construction, and management and monitoring of the plants to ensure replanting success pursuant to requirements included in permits issued for the project.
  - The plan shall specify monitoring and performance criteria for the species planted, invasive species control criteria, as well as the best time of year for seeding to occur, pursuant to requirements of permits from the various resource agencies with regulatory purview over the project. Revegetated areas shall be monitored for a five-year period to track progress toward performance criteria.
  - Native riparian vegetation within the project construction footprint shall be salvaged prior to construction and replanted after construction is completed. Areas impacted by construction-related activity shall be replanted or reseeded with native trees, shrubs, and herbaceous perennials and annuals from the watershed under guidance from a qualified biologist. Local plant materials shall be used for revegetation of the disturbed area. The plant materials shall include local cuttings from the local watershed or from adjacent watersheds.
  - The Habitat Restoration and Monitoring Plan shall also address restoration of jurisdictional wetlands and waters. Temporary impacts to wetlands shall be restored onsite with native wetland species under guidance from a qualified biologist. Permanent impacts to jurisdictional wetlands shall be mitigated for by replacement on- or off-site at an equal ratio or whatever more stringent requirements are included in the permits to be issued for the project.
  - The monitoring plan shall include annual monitoring of restored areas for at least 5 years. The plan shall contain vegetation management protocols, protocols for monitoring replanting success, and an adaptive management plan if success criteria are not being met. The adaptive management plan would include interim thresholds for replanting success and alternative management approaches, such as weed control or additional replanting, to undertake if thresholds are not met.

4.2 Special-status Species

4.2.1 Rail Species

Nesting Ridgway’s rail and California black rail may be present within the marshlands of Petaluma Marsh and Shollenberger Park. To avoid disturbing these species, the following measure may be implemented:

- Prior to construction, protocol-level surveys shall be conducted in all suitable habitat for Ridgway's (California clapper) rail or California black rail, following the methods detailed in the USFWS *Site-Specific Protocol for Monitoring Marsh Birds* (2017). No work activities, visual disturbance (direct line of sight) and/or increase in the ambient noise level shall occur within 700 feet [215 meters] of areas where rails have been detected and are likely to be nesting during the breeding season (January 15 - August 31), or a distance determined in coordination with U.S. Fish and Wildlife [USFWS] or the California Department of Fish and Wildlife [CDFW]).

- If surveys are not conducted, nesting rails shall be assumed present in suitable marsh habitat adjacent to the alignment and proposed multi-use path.

- As the California black rail, Ridgway's rail and salt marsh harvest mouse are all California fully protected species, as well as state and/or federal listed species, the City shall avoid all take of these species.

4.2.2 Steelhead

Adobe Creek is critical habitat for steelhead, which may be present in its waters connecting to the Petaluma River in winter months when the channel is flowing. To avoid impacts to steelhead, work would be performed with appropriate approvals from the National Marine Fisheries Service as well as other applicable state and federal agencies, and the City and contractors would comply with all required permit conditions for directional drilling at Adobe Creek.

4.2.3 Salt Marsh Harvest Mouse, California Red-legged Frog, Foothill Yellow-legged Frog and Western Pond Turtle

Adobe Creek, Petaluma Marsh, Shollenberger Park and ECWRF lands along the alignment have potential habitat for California red-legged frog and western pond turtle, and Shollenberger Park and Petaluma Marsh have potential habitat for salt marsh harvest mouse. To avoid impacts to these special-status species, if present, the following measures may be implemented:

- To avoid impacts to salt marsh harvest mouse, western pond turtle, foothill yellow-legged frog or California red-legged frog, if present, ground disturbance to marsh habitat (including emergent vegetation such as bulrush and cattails) will be avoided to the maximum extent feasible.

- Work areas within 200 feet of potential salt marsh harvest mouse, western pond turtle, foothill yellow-legged frog or California red-legged frog habitat shall be bordered by temporary exclusion fencing. The fence should be made of a smooth material that does not allow mice to climb or pass through, of a minimum above-ground height of 30 inches, and the bottom should be buried to a depth of at least 6 inches so that mice cannot crawl under the fence. Installation of the fence shall be monitored by a USFWS- and CDFW-approved biologist with experience with these species, who will check the fence alignment prior to vegetation clearing and fence installation to ensure no sensitive species are present.

- Where marsh habitat cannot be avoided, vegetation shall be removed from the ground disturbance work area, plus a 10-foot buffer around the area, with mechanized hand tools or by another method approved by the USFWS and CDFW. Vegetation height shall be maintained at or below 5 inches above ground. Vegetation removal in wetland habitat shall be conducted under the supervision of a qualified biologist.

4.2.4 Nesting Birds

Nesting migratory birds may use riparian woodland, freshwater marsh and grassland habitats for nesting in trees, shrubs or tall grasses. The highly developed surroundings and the limited number of trees and shrubs present along the alignment reduces the likelihood for birds to nest in developed lands; however, migratory birds acclimatized to human presence and noise could use ornamental vegetation for nesting.

If construction activities are scheduled to occur during the bird nesting season (February 1 through August 31), the City or its contractor may implement the following measures to avoid potential impacts to nesting raptors and other nesting birds.

- No more than two weeks prior to construction, a qualified biologist shall perform preconstruction surveys for nesting birds within 250 feet of construction areas, where access is available. If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further avoidance is required.
- If active nests are detected during preconstruction surveys, workers shall create a no-disturbance buffer around active raptor nests and nests of other special-status birds during the breeding season, or until it is determined that young birds have fledged. Buffers shall be at least 250 feet for raptors and at least 150 feet for other nesting birds. Nests initiated within the active construction area may have reduced buffer sizes due to the increased tolerance of disturbance. Reductions to nest buffer distances may be allowed on a case-by-case basis in coordination with the CDFW based on site-specific factors such as the existing disturbance levels, the species of nesting bird, and the magnitude of the proposed disturbance.

CHAPTER 5
References and Report Preparation

5.1 References

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5.2 Document Preparation

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Appendix A
Species with Potential to Occur

TABLE A-1
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE PIPS PARALLEL FORCE MAIN PROJECT AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Invertebrates			
Western bumble bee (*Bombus occidentalis*)	--/SC	Found in any area with sufficient flowers for nutrition, and underground burrows for nest for the queen.	**Low.** Limited suitable burrowing habitat for this species.
Monarch butterfly (*Danaus plexippus plexippus*) (overwintering sites)	FC/--	Monarch butterfly breeding and larval habitat is on milkweed plants in open fields and meadows. During winter it stays in colonies in eucalyptus, Monterey cypress and other trees in California and at high altitudes in Mexico.	**Low.** Lack of large trees suitable for wintering monarchs.
California freshwater shrimp (*Syncaris pacifica*)	FE/SE	Shallow pools away from main streamflow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	**Absent.** Perennial stream and pool habitat not found on-site.
Fish			
Coho salmon *Oncorhynchus kisutch* Central California Coast ESU	FE/CE/--	Federal listing refers to populations south of Punta Gorda, California as well as such Coho salmon originating from tributaries to San Francisco Bay. Larger rivers serve as migration pathways for adults; juveniles rear in smaller tributaries.	**Low.** Petaluma River and Adobe Creek are accessible to this species, but they are considered extirpated from this area.
Steelhead *Oncorhynchus (=Salmo) mykiss irideus* Central California Coast DPS	FT/*/--	Spawns and rears in coastal streams between the Russian River in Sonoma County and Soquel Creek in Santa Cruz County, as well as drainages tributary to San Francisco Bay, where gravelly substrate and shaded riparian habitat occurs.	**High.** Adobe Creek is critical habitat for this species, which may be present in wetter months with sufficient flow.
Amphibians			
California tiger salamander - Sonoma DPS *(Ambystoma californiense)*	FE/ST	Vernal or temporary pools in annual grasslands, or open stages of woodlands. Typically adults use mammal burrows.	**Absent.** Aquatic habitat on project alignment is not suitable for this species, and outside the species' known range.
California giant salamander (*Dicamptodon ensatus*)	--/SSC	Wet coastal forests near clear perennial waters in montane or valley-foothill riparian habitats. Typically adults use mammal burrows.	**Absent**. No suitable perennial aquatic habitat present on-site.
Foothill yellow-legged frog (*Rana boylii*)	--/SSC	Partly-shaded, shallow streams & riffles with a rocky substrate in a variety of habitats; requires at least some cobble-sized substrate for egg-laying.	**Low to Moderate**. Recorded approximately ¼ mile upstream in Adobe Creek in 2008 (CDFW 2022) but along project alignment, the creek is dry and lacks rocky substrate.
California red-legged frog (*Rana draytonii*)	FT/SSC	Streams, freshwater pools, and ponds with overhanging vegetation. Also found in woods adjacent to streams. Requires permanent or ephemeral water sources such as reservoirs and slow-moving streams and pools of >0.5 m depth for breeding.	**Low to Moderate**. Recorded in Ellis Creek near Petaluma Marsh in 1994 (CDFW 2022). Not known from Adobe Creek near project alignment, and the creek is dry in this area, while nearby marsh habitat is seasonal and brackish.

TABLE A-1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE PIPS PARALLEL FORCE MAIN PROJECT AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Amphibians (cont.)			
Red-bellied newt (*Taricha rivularis)*	--/SSC	Found in rivers and streams in coastal woodlands and redwood forests. Hide in vegetation and under stones during the day.	**Low.** Project alignment lacks suitable perennial stream habitat for this species.
Reptiles			
Western pond turtle (*Actinemys marmorata*)	--/SSC	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation <6,000' in elevation. Require basking area and upland habitat for egg laying (sandy banks and open, grassy fields).	**Moderate to High.** Recorded in Ellis Creek near Petaluma Marsh in 2007 and Shollenberger Park in 2008 (CDFW 2022). May occur in Adobe Creek or marsh in Shollenberger during wet season.
Birds			
Tricolored blackbird (*Agelaius tricolor)*	--/ST	Colonial nester in freshwater marsh and wetlands; forages in wetland, grassland and agricultural fields; sometimes in mixed flocks with other blackbirds.	**Low.** This species may utilize grasslands near the alignment for foraging, but it is unlikely to nest in the vicinity.
Grasshopper sparrow (*Ammodramus savannarum)*	--/SSC	Prefer grasslands, including weedy areas, agricultural fields, and prairies. Avoid areas with significant shrub cover.	**Low.** Grassland habitat for this species is disturbed and fragmented.
Golden eagle (*Aquila chrysaetos)*	--/CFP	Ranges widely across North America, foraging in open areas of tundra, prairie, rangeland or desert that support small mammal prey; nests on cliffs or tall trees.	**Low.** No suitable nesting habitat for this species but it may forage over Shollenberger Park.
Burrowing owl (*Athene cunicularia*)	--/SSC	Subterranean nester, dependent upon burrowing mammals, often California ground squirrel, for burrows and prey. Found in open, dry grasslands, deserts and scrublands with low-growing vegetation.	**Low**. Project area grassland is disturbed and fragmented and unlikely to provide suitable habitat for this species.
Swainson's hawk (*Buteo swainsoni)*	--/ST	Forages over agricultural land, rangeland or grassland; nests in preferably tall trees close to suitable foraging habitat	**Low.** This species may forage in the area but is not known to nest nearby. No nearby records in CNDDB (CDFW 2022).
Western snowy plover (*Charadrius alexandrines nivosus*)	FT/SSC	Sandy beaches, salt pond levees & shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	**Absent.** Suitable nest habitat for this species is absent or highly disturbed.
Yellow rail (*Coturnicops noveboracensis)*	--/SSC	Found in shallow marshes or wet meadows, often dominated by grasses or sedges.	**Low.** Species is extremely rare in California; nearest occurrences are in Suisun Marsh from 100 years ago.
Black swift (*Cypseloides niger)*	BCC/SSC	Occur in wide range of habitats, but nest in specialized sites, in forested areas near rivers, often behind waterfalls or on damp cliffs.	**Low.** Species may fly over site but no nesting habitat is present.
White-tailed kite (*Elanus leucurus*)	--/CFP	Found in open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	**Moderate.** Suitable habitat is present and species may nest or forage in vicinity.

TABLE A-1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE PIPS PARALLEL FORCE MAIN PROJECT AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Birds (cont.)			
American peregrine falcon (*Falco peregrinus anatum*)	BCC/CFP	Nest consists of a scrape or a depression on rock, cliff or building ledge over an open site.	**Low.** Suitable foraging habitat on-site, but nesting habitat is not present.
Salt-marsh common yellowthroat (*Geothylpis thrichas sinuosa*)	--/SSC	In brackish and saline tidal marsh habitat around San Francisco Bay, associated with a high percent cover of rushes (*Scirpus* spp.), Peppergrass (*Lepidium latifolium*), and *Juncus* spp.	**Moderate.** Suitable marsh habitat is present in the vicinity of the alignment, though disturbance is high.
California black rail (*Laterallus jamaicensis*)	BCC/ST/ CFP	Found in salt, brackish and freshwater marsh with dense vegetation for nesting habitat.	**Low to Moderate.** Records from Petaluma Marsh and River within the last decade (CDFW 2022). May be present in vicinity of alignment in brackish marsh vegetation.
San Pablo song sparrow (*Melospiza melodia samuelis*)	BCC/SSC	Inhabits tidal marshes; nests in *Grindelia* or other marsh plants bordering slough channels. Its year-round range is confined to tidal and brackish marshes fringing San Pablo Bay.	**Present.** Recorded in Petaluma Marsh in 1981, and near the mouth of Petaluma River in 2004 (CDFW 2022). Suitable marsh habitat is present in Shollenberger Park area; species was observed during survey.
California Ridgway's rail (*Rallus obsoletus obsoletus)*	FE/SE/ CFP	Found in salt and brackish marsh with well-defined tidal channels and dense growth of pickleweed; feeds on invertebrates in mud-bottomed sloughs.	**Low to Moderate.** Records from Petaluma Marsh and River within the last decade (CDFW 2022). May be present in vicinity of alignment in salt marsh vegetation.
Bank swallow (*Riparia riparia*)	--/ST	Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	**Absent.** Suitable bank habitat not found on-site.
Northern spotted owl (*Strix occidentalis caurina*)	FT/ST	In Marin County, northern spotted owls nest in secondary-growth redwood and fir forests, featuring dense canopy closure of mature trees, abundant logs, standing snags, and live trees with broken tops.	**Absent.** Suitable forest habitat not present on project alignment.
Mammals			
Pallid bat (*Antrozous pallidus*)	--/SSC	Grasslands, shrublands, woodlands, and forests. Common in arid regions with rocky outcroppings, particularly near water. Roosts in rock crevices, buildings, and under bridges; may also roost in trees. Very sensitive to disturbance.	**Low**. May forage over site, but suitable roost habitat is limited.
Point Reyes mountain beaver (*Aplodontia rufa phaea*)	--/SSC	Burrows in cool, moist, north-facing slopes in moderately dense coastal scrub in Point Reyes.	**Absent.** Project area outside of subspecies' known range.
Townsend's big-eared bat (*Corynorhinus townsendii*)	--/SSC	Montane forests, herbaceous, shrub, and open stages of most habitats with dry, friable soils. Roosts in caves and cave-like settings; sensitive to disturbance.	**Moderate.** May forage over site but suitable roost habitat not present.

TABLE A-1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE PIPS PARALLEL FORCE MAIN PROJECT AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Mammals (cont.)			
Hoary bat (*Lasiurus cinereus*)	--/--/ WBWG Medium	Prefers open habitats or habitat mosaics, with access to trees for cover & open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths.	**Moderate.** Suitable tree roosting habitat present on-site and in the vicinity.
Salt marsh harvest mouse (*Reithrodontomys raviventris*)	FE/SE/ CFP	Pickleweed is primary habitat, but may occur in other marsh vegetation types and in adjacent upland areas. Does not burrow; builds loosely organized nests. Requires higher areas for flood escape.	**Low to Moderate.** Recorded in Petaluma River marsh west of alignment in 1990 (CDFW 2022), but no suitable (pickleweed) habitat along the alignment; may occasionally seek refugia in Shollenberger.
Suisun shrew *(Sorex ornatus sinuosus)*	--/SSC	Inhabits salt and brackish marshes around northern San Pablo and Suisun bays with low, dense vegetation and invertebrate prey.	**Low.** Recorded SE of project alignment along the bay, but site has limited suitable marsh vegetation with nearby human disturbance.
American badger (*Taxidea taxus*)	--/SSC	Herbaceous, shrub, and open stages of most habitats with dry, friable soils. Sensitive to human disturbance.	**Low.** Friable open habitat is present but disturbed and close to human traffic.
Plants			
Franciscan onion *(Allium peninsulare* var. *franciscanum)*	--/--/1B.2	Cismontane woodland, valley and foothill grassland. Blooms April – June. Elevation 50 – 300 meters.	**Low.** Suitable valley and foothill grassland or woodland habitat is not present.
Napa false indigo (*Amorpha californica* var. *napensis*)	--/--/1B.2	Broadleafed upland forest, chaparral, or cismontane woodland. Blooms April – July. Elevation up to 2000 meters.	**Low.** Suitable forest or woodland habitat is not present.
Bent-flowered fiddleneck (*Amsinckia lunaris*)	--/--/1B.2	Cismontane woodland, valley and foothill grassland, and coastal bluff scrub. Blooms March – June. Elevation up to 500 meters.	**Low.** Suitable montane woodland habitat is not present.
Mt. Tamalpais manzanita (*Arctostaphylos montana* subsp. *montana*)	--/--/1B.3	Serpentine chaparral. Blooms February - April. Elevation ranges from 250 – 800 meters.	**Low.** Site lacks serpentine chaparral habitat.
Marin manzanita (*Arctostaphylos virgata*)	--/--/1B.2	Sandstone, granite outcrops in chaparral, and conifer forests. Blooms December - March. Elevation up to 500 meters.	**Low.** Site lacks suitable chaparral habitat.
alkali milk-vetch (*Astragalus tener* var. *tener*)	--/--/1B.2	Playas, valley and foothill grassland (adobe clay), vernal pools. Blooms March to June. Elevation up to 60 meters	**Absent.** Site lacks suitable playa, vernal pool or adobe clay habitat.
Big-scale balsamroot *(Balsamorhiza macrolepis)*	--/--/1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Blooms March to June. Elevation 150 to 1500 meters.	**Low.** Site lacks suitable chaparral or grassland habitat.
Sonoma sunshine (*Blennosperma bakeri)*	FE/SE/ 1B.1	Valley and foothill grassland (mesic). Vernal pools. Blooms March to May. Elevation 10 to 110 meters.	**Low.** Site lacks suitable grassland or vernal pool habitat.

TABLE A-1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE PIPS PARALLEL FORCE MAIN PROJECT AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Plants (cont.)			
Narrow-anthered brodiaea *(Brodiaea leptandra)*	--/--/1B.2	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Blooms May to July. Elevation 100 to 900 meters.	**Low.** Site lacks suitable forest or woodland habitat.
Seaside bittercress *Cardamine angulate*	--/--/2B.1	Wetland-riparian areas in mixed evergreen forest.	**Low.** No mixed evergreen forest present onsite.
Tiburon paintbrush (*Castilleja affinis* var. *neglecta*)	FE/ST/ 1B.2	Open serpentine grassland slopes. Blooms April – June. Elevation ranges from 60 – 400 meters.	**Low.** Site lacks serpentine grassland habitat.
Nicasio ceanothus (*Ceanothus decornutus*)	--/--/1B.2	Open, rocky serpentine slopes and ridges. Blooms March – May. Elevation ranges from 235 – 290 meters.	**Low.** Site lacks serpentine slopes and ridges.
Mason's cceanothus Ceanothus masonii	--/--/1B.2	Chaparral (openings, rocky, serpentinite). Blooms March – April. Elevation 230-500 meters.	**Low.** Site lacks serpentine chaparral.
Rincon Ridge ceanothus (*Ceanothus confusus)*	--/--/1B.1	Closed-cone coniferous forest, chaparral, cismontane woodland. Blooms February to June. Elevation from 75 to 1,060 meters	**Low.** Site lacks suitable forest or woodland habitat.
Pappose tarplant (*Centromadia parryi* ssp. *parryi)*	--/--/1B.2	Chaparral, coastal prairie, meadows and seeps, marshes and swamps (coastal salt), valley and foothill grassland (vernally mesic). Blooms May to November. Elevation to 420 meters.	**Low.** Site lacks suitable chaparral or meadow habitat.
Soft salty bird's-beak (*Chloropyron molle* ssp. *molle)*	FE/SR/ 1B.2	Coastal salt marshes and swamps. Blooms June to November. Elevation to 3 meters.	**Low.** Nearby salt marsh habitat is highly disturbed. Records from 1993 are possibly extirpated (CDFW 2022).
Point Reyes bird's-beak (*Chloropyron maritimum* ssp. *palustre*)	--/--/1B.2	Coastal salt marsh. Blooms May – October. Elevation up to 10 meters.	**Low.** Record from 1993 counted 1675 plants in Petaluma Marsh (CDFW 2022). May be present near Petaluma River but unlikely at alignment, which is primarily freshwater.
Sonoma spineflower (*Chorizanthe valida*)	FE/SE/ 1B.1	Costal sandy prairie. Blooms June to August. Elevation up to 300 meters.	**Absent.** No sandy habitat on-site.
Mt. Tamalpais thistle (*Cirsium hydrophilum* var. *vaseyi*)	--/--/1B.2	Serpentine seeps. Blooms June – September. Elevation 300 – 450 meters.	**Low.** Site is dry and lacks serpentine.
Baker's larkspur *(Delphinium bakeri)*	FE/SE/ 1B.1	Broadleafed upland forest, coastal scrub, valley and foothill grassland. Blooms March to May. Elevation 80 to 305 meters.	**Low.** No suitable forest, scrub or grassland habitat on-site.
Golden larkspur (*Delphinium luteum)*	FE/SR/ 1B.1	Chaparral, coastal prairie, coastal scrub. Blooms March to May. Elevation to 100 meters.	**Low.** No chaparral or coastal scrub habitat on-site.
Dwarf downingia *(Downingia pusilla)*	--/--/2B.2	Valley and foothill grassland (mesic), vernal pools. Blooms March to May. Elevation up to 445 meters.	**Low.** Site lacks suitable vernal pool or mesic grassland habitat.

TABLE A-1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE PIPS PARALLEL FORCE MAIN PROJECT AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Plants (cont.)			
Tiburon buckwheat (*Eriogonum luteolum* var. *caninum*)	--/--/1B.2	Serpentine. Blooms May - September. Elevation up to 700 meters.	**Low.** No serpentine habitat on-site.
Koch's cord moss (*Entosthodon kochii)*	--/--/1B.3	Cismontane woodland (soil). Riverbanks on newly exposed soil. Elevation 180 to 1,000 meters.	**Low.** No woodland habitat on-site.
Fragrant fritillary (*Fritillaria liliacea*)	--/--/1B.2	Heavy soils on open hills and fields near the coast. Blooms from February – April. Elevation up to 400 meters.	**Low.** Seasonal wetland onsite provides marginally suitable habitat.
Marin checker lily (*Fritillaria lanceolata* var. *tristulis*)	--/--/1B.1	Coastal scrub, prairie and woodland. Blooms February – May. Elevation ranges from 15-150 meters.	**Low.** Seasonal wetland onsite provides marginally suitable habitat.
Woolly-headed gilia *Gilia capitata ssp. tomentosa*	--/--/1B.1	Coastal bluff scrub, valley and foothill grassland, rocky outcrops, serpentinite. Blooms May – July. Elevation 10 -220 m.	**Low.** Site lacks scrub or grassland habitat.
Congested-headed hayfield tarplant (*Hemizonia congesta* subsp. *congesta*)	--/--/1B.2	Grassy sites and marsh edges. Blooms April – November. Elevation up to 560 meters.	**Low.** Seasonal wetland onsite provides marginal habitat.
Marin western flax (*Hesperolinon congestum*)	FT/ST/ 1B.1	Serpentine grassland. Blooms April – August. Elevation up to 200 meters.	**Low.** Site lacks serpentine soil habitat.
Thin-lobed horkelia (*Horkelia tenuiloba*)	--/--/1B.2	Sandy soils within open chaparral. Blooms April – July. Elevation from 50 – 500 meters.	**Low.** Site is outside preferred elevation range and lacks chaparral habitat.
Burke's goldfields *(Lasthenia burkei)*	FE/SE/ 1B.1	Meadows and seeps (mesic), vernal pools. Blooms April to June. Elevation 15 to 600 meters.	**Low.** Site lacks suitable vernal pool or mesic grassland habitat.
Contra Costa goldfields *(Lasthenia conjugens)*	FE/--/1B.1	Cismontane woodland (mesic), playas (alkaline). valley and foothill grassland, vernal pools. Booms March to June. Elevation up to 470 meters.	**Low.** Site lacks suitable vernal pool or mesic grassland habitat.
Legenere *(Legenere limosa)*	--/--/1B.1	Vernal pools. Blooms April to June. Elevation up to 880 meters.	**Low.** Site lacks suitable vernal pool habitat.
Jepson's leptosiphon (*Leptosiphon jepsonii*)	--/--/1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Blooms March to May. Elevation 100 to 500 meters.	**Low.** Site is outside preferred elevation range and lacks chaparral habitat.
Tamalpais lessingia (*Lessingia micradenia* var. *micradenia*)	--/--/1B.2	Thin, gravelly soils of serpentine outcrops and roadcuts. Blooms July – October. Elevation from 60 – 305 meters.	**Low.** Serpentine habitat not present on-site.
Sebastopol meadowfoam *(Limnanthes vinculans)*	FE/SE/ 1B.1	Meadows and seeps, valley and foothill grassland, vernal pools. Blooms April to May. Elevation 15 to 305 meters.	**Low.** Site lacks suitable vernal pool, meadow seep or grassland habitat.
Pitkin marsh lily *(Lilium pardalinum ssp. pitkinense)*	FE/SE/ 1B.1	Cismontane woodland, meadows and seeps, marshes and swamps (freshwater). Blooms June to July. Elevation 35 to 65 meters.	**Low.** No suitable forest or grassland habitat on-site. Nearby occurrence dates from 1880 (CDFW 2022).

TABLE A-1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE PIPS PARALLEL FORCE MAIN PROJECT AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Plants (cont.)			
Cobb Mountain lupine *(Lupinus sericatus)*	--/--/1B.2	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest. Blooms March to June. Elevation 275 to 1525 meters.	**Absent.** Project is outside of species' known range.
Marsh microseris (*Microseris paludosa*)	--/--/1B.2	Moist grassland and open woodland. Blooms April – June. Elevation up to 300 meters.	**Low.** Moist grassland habitat not present on-site.
Marin County navarretia (*Navarretia rosulata*)	--/--/1B.2	Rocky serpentine areas. Blooms May – July. Elevation from 200 – 600 meters.	**Low.** Serpentine habitat not present on-site.
Baker's navarretia (*Navarretia leucocephala ssp. bakeri)*	--/--/1B.1	Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools. Blooms April to July. Elevation to 1740 meters.	**Low.** No suitable forest, meadow seep or grassland habitat on-site.
White-rayed pentachaeta (*Pentchaeta bellidiflora*)	FE/SE/ 1B.1	Valley grasslands. Blooms March – May. Elevation up to 620 meters.	**Low.** Site lacks suitable grassland habitat.
North Coast semaphore grass (*Pleuropogon hooverianus*)	--/ST/1B.1	Wet grassy areas. Blooms March – June. Elevation up to 1,300 meters.	**Low.** Seasonal wetland onsite provides marginally suitable habitat.
Marin knotweed (*Polygonum marinense*)	--/--/3.1	Coastal salt and brackish marshes, swamps. Blooms April – August. Elevation up to 10 meters.	**Low.** Suitable salt marsh habitat present in vicinity but nearby occurrence dates from 1945 (CDFW 2022).
Tamalpais oak (*Quercus parvula* var. *tamalpaisensis*)	--/--/1B.3	Understory of conifer woodlands. Blooms March – April. Elevation from 100 – 750 meters.	**Low.** No conifer woodlands in vicinity.
Point Reyes checkerbloom (*Sidalcea calycosa* subsp. *rhizomata*)	--/--/1B.2	Freshwater marshes. Blooms May – July. Elevation up to 30 meters.	**Low.** Marshes in the vicinity are primarily brackish and nearby record dates from 1880 (CDFW 2022).
Marin checkerbloom (*Sidalcea hickmanii* subsp. *viridis*)	--/--/1B.1	Dry ridges near coast in serpentine areas. Blooms May – June. Elevation ranges from 50 – 430 meters.	**Low.** No serpentine habitat present on-site
Mt. Burdell jewelflower *(Streptanthus anomalus)*	--/--/1B.1	Cismontane woodland openings. Blooms May to June. Elevation 50 to 150 meters.	**Low.** No woodland habitat present on-site.
Mt. Tamalpais jewelflower (*Streptanthus batrachopus*)	--/--/1B.3	Serpentine barrens and chaparral. Blooms April – July. Elevation ranges from 335 – 670 meters.	**Low.** No serpentine habitat present on-site.
Mt. Tamalpais bristly jewelflower (*Streptanthus glandulosus ssp. pulchellus*)	--/--/1B.2	Dry, open grassland, chaparral, open conifer/oak woodland; occasionally serpentine. Blooms May – August. Elevation ranges from 125 – 670 meters.	**Low.** No serpentine grassland habitat on-site.
Two-fork clover (*Trifolium amoenum*)	FE/--/1B.1	Moist, heavy soils in disturbed areas, coastal bluff scrub/serpentine, and grassland. Blooms April – June. Elevation ranges from 5 – 415 meters.	**Low.** No serpentine grassland habitat on-site.

TABLE A-1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN THE PIPS PARALLEL FORCE MAIN PROJECT AREA

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Project Area
Plants (cont.)			
Saline clover *(Trifolium hydrophilum)*	--/--/1B.2	Marshes and swamps, mesic and alkaline valley and foothill grasslands (mesic, alkaline), vernal pools.	**Low.** Site lacks vernal pools and marsh habitat on-site is disturbed.
Pacific Grove clover *(Trifolium polyodon)*	--/SR/ 1B.1	Closed-cone coniferous forest, coastal prairie, meadows and seeps, valley and foothill grassland. Blooms April to June. Elevation 5 to 425 meters.	**Low.** No suitable forest or grassland habitat on-site.
Oval-leaved viburnum *(Viburnum ellipticum)*	--/--/2B.3	Chaparral, cismontane woodland, lower montane coniferous forest. Blooms May to June. Elevation 210 to 1,400 meters	**Low.** No suitable forest or woodland habitat on-site.

Status Codes:

USFWS (U.S. Fish and Wildlife Service)
- FE = Listed as Endangered by the Federal Government
- FT = Listed as Threatened by the Federal Government.
- FC = Listed as Candidate
- BBC = USFWS Bird of Conservation Concern

CDFW (California Department of Fish and Wildlife)
- SE = Listed as Endangered by the State of California
- ST = Listed as Threatened by the State of California
- SR = Listed as Rare by the State of California
- CaT = Candidate Threatened by the State of California
- CFP = California Fully Protected species
- SSC = Species of Special Concern
- WBWG = Western Bat Working Group

California Native Plant Society:

List 1A=Plants presumed extinct in California
List 1B=Plants rare, Threatened, or Endangered in California and elsewhere
List 2= Plants rare, Threatened, or Endangered in California but more common elsewhere
List 3= Plants about which more information is needed
List 4= Plants of limited distribution
An extension reflecting the level of threat to each species is appended to each rarity category as follows:
- .1 – Seriously endangered in California
- .2 – Fairly endangered in California
- .3 – Not very endangered in California

Potential to Occur Categories:

Absent = The Project and/or immediate vicinity does not support suitable habitat for a particular species. Project site may be outside of the species' known range.
Low Potential = The Project and/or immediate vicinity only provides limited habitat. In addition, the species' known range may be outside of the Project site.
Moderate Potential = The Project and/or immediate vicinity provides suitable habitat.
High Potential = The Project and/or immediate vicinity provides ideal habitat conditions or the species has been observed.
Present = Species has been recorded within the Project Site or immediate vicinity.

SOURCES: California Department of Fish and Wildlife (CDFW), California Natural Diversity Data Base, 2022, Petaluma Point, Petaluma, Sears Point, Cotati, Novato, Sonoma, Glen Ellen, Petaluma River, San Geronimo USGS 7.5 minute quads. Available: http://dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp; California Native Plant Society, Inventory or Rare, Threatened and Endangered Plants of California, 2022. Available online at http://www.rareplants.cnps.org/; U.S. Fish and Wildlife Service (USFWS), iPac Information for Planning and Conservation. Online database powered by ECOS Environmental Conservation Online System, 2022. Available online at https://ecos.fws.gov/ipac/.

Appendix B
Site Photographs

Photo 1. Non-native grassland on western end of alignment near Marriott hotel (Figure 2a) 8/2/22

Photo 2. Non-native grassland and disturbed land underneath Highway 101 (Figure 2a) 8/2/22

Photo 3. Disturbed land along alignment in Sheraton parking lot (Figure 2b) 8/2/22

Photo 4. Pipeline route along former railroad berm adjacent to marsh channel at Shollenberger (Figure 2b) 8/2/22

Photo 5. Facing westward into non-native grassland along former railroad berm (Figure 2b) 8/2/22

Photo 6. Adobe Creek at alignment crossing facing upstream (Figure 2c) 6/14/23

Photo 7. Non-native grassland along alignment adjacent to Shollenberger Park parking area (Figure 2c) 8/2/22

Photo 8. Alignment runs in disturbed land behind buildings adjacent to Shollenberger Park (Figure 2d) 8/2/22

Photo 9. Cattail (*Typha* sp.) marsh along alignment in Shollenberger Park extension (Figure 2d) 8/2/22

Photo 10. Eastern terminus of alignment in disturbed and non-native grassland at Ellis Creek WRF (Figure 2e) 8/2/22