Scenic Road Pipeline Replacement Project

Draft Initial Study – Mitigated Negative Declaration

prepared by

Carmel Area Wastewater District
3945 Rio Road
Carmel, California 93922
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Initial Study

1. Project Title

Scenic Road Pipeline Replacement Project

2. Lead Agency Name and Address

Carmel Area Wastewater District
3945 Rio Road
Carmel, California 93922

3. Contact Person and Phone Number

Patrick Treanor, PE, District Engineer
(831) 257-0436

4. Project Location

The project alignment is located in the City of Carmel-by-the-Sea (City) and unincorporated County of Monterey (County), California. The project alignment is generally along the Scenic Road right-of-way between Ocean Avenue and Martin Way in Carmel-by-the Sea, and between Martin Way and the existing Bay and Scenic pump station at Carmel Point in the County of Monterey. The project alignment is also along Santa Lucia Avenue, San Antonio Avenue, Valley View Avenue, 15th Avenue, Carmelo Street, Camino Real, 14th Avenue, and Dolores Street, and private property associated with the Mission Ranch hotel and restaurant in the County of Monterey. The regional project location is shown in Figure 1, and the detailed project location is shown in Figure 2.

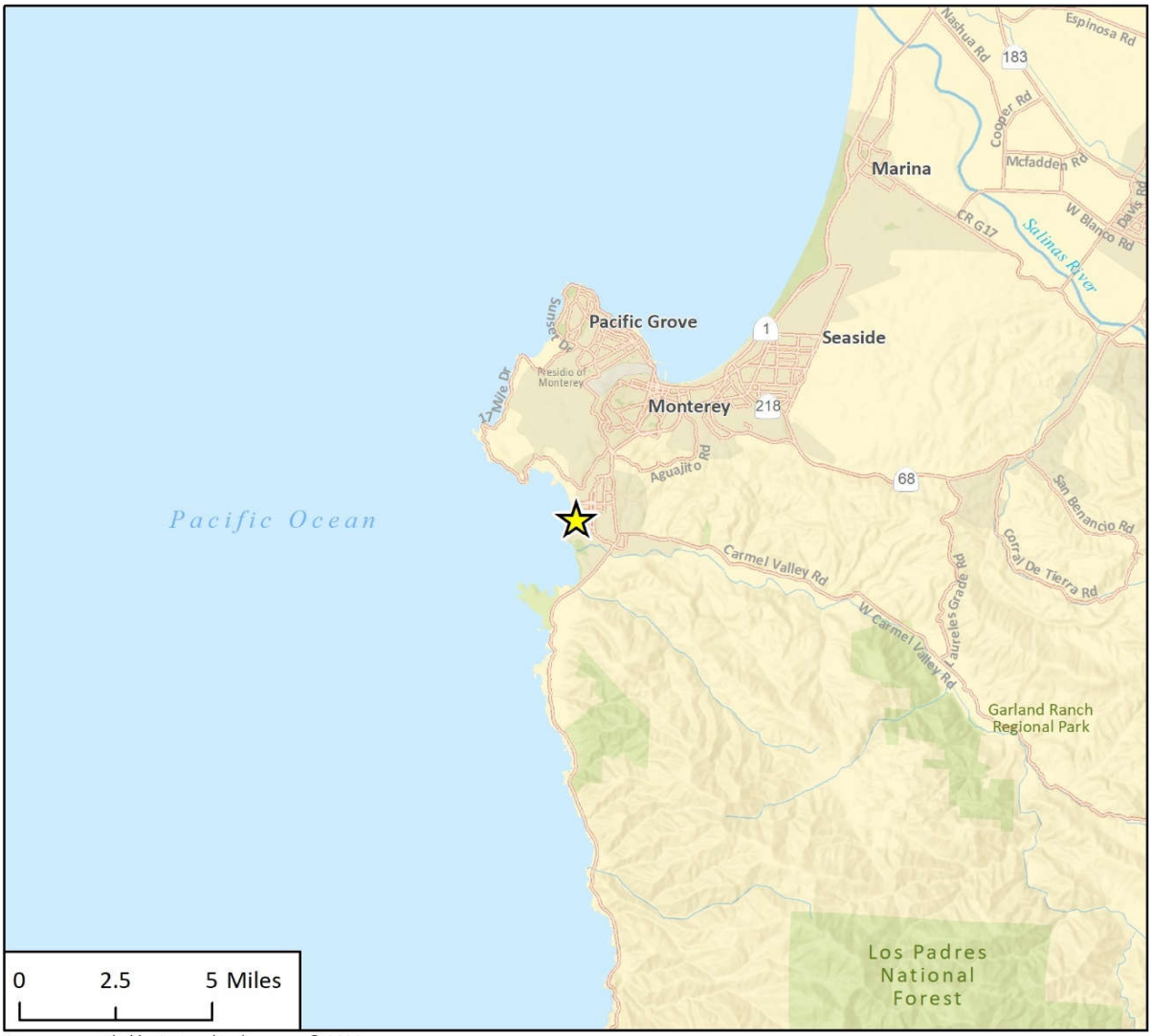
5. Project Sponsor's Name and Address

Carmel Area Wastewater District
3945 Rio Road
Carmel, California 93922

6. General Plan Designation

Most of the project alignment is located within existing public roadway rights-of-way, which do not have General Plan designations within the City or the County. In the County, a portion of the project alignment within the Mission ranch hotel and restaurant property is designated as Medium Density Residential (County of Monterey 2008).

Figure 1 Regional Project Location



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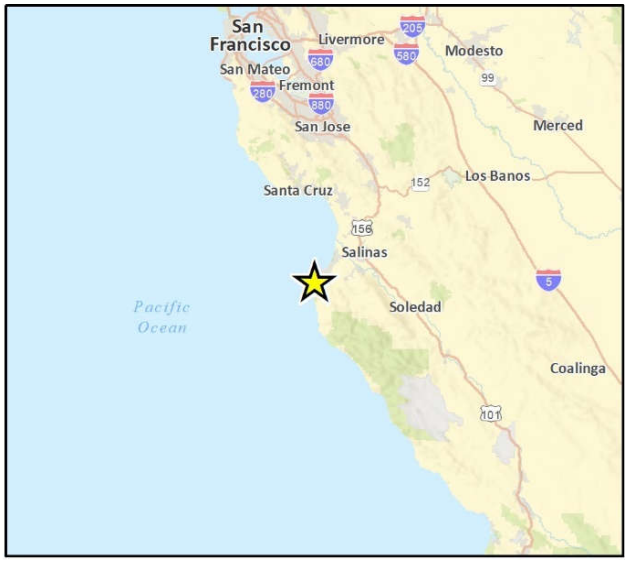
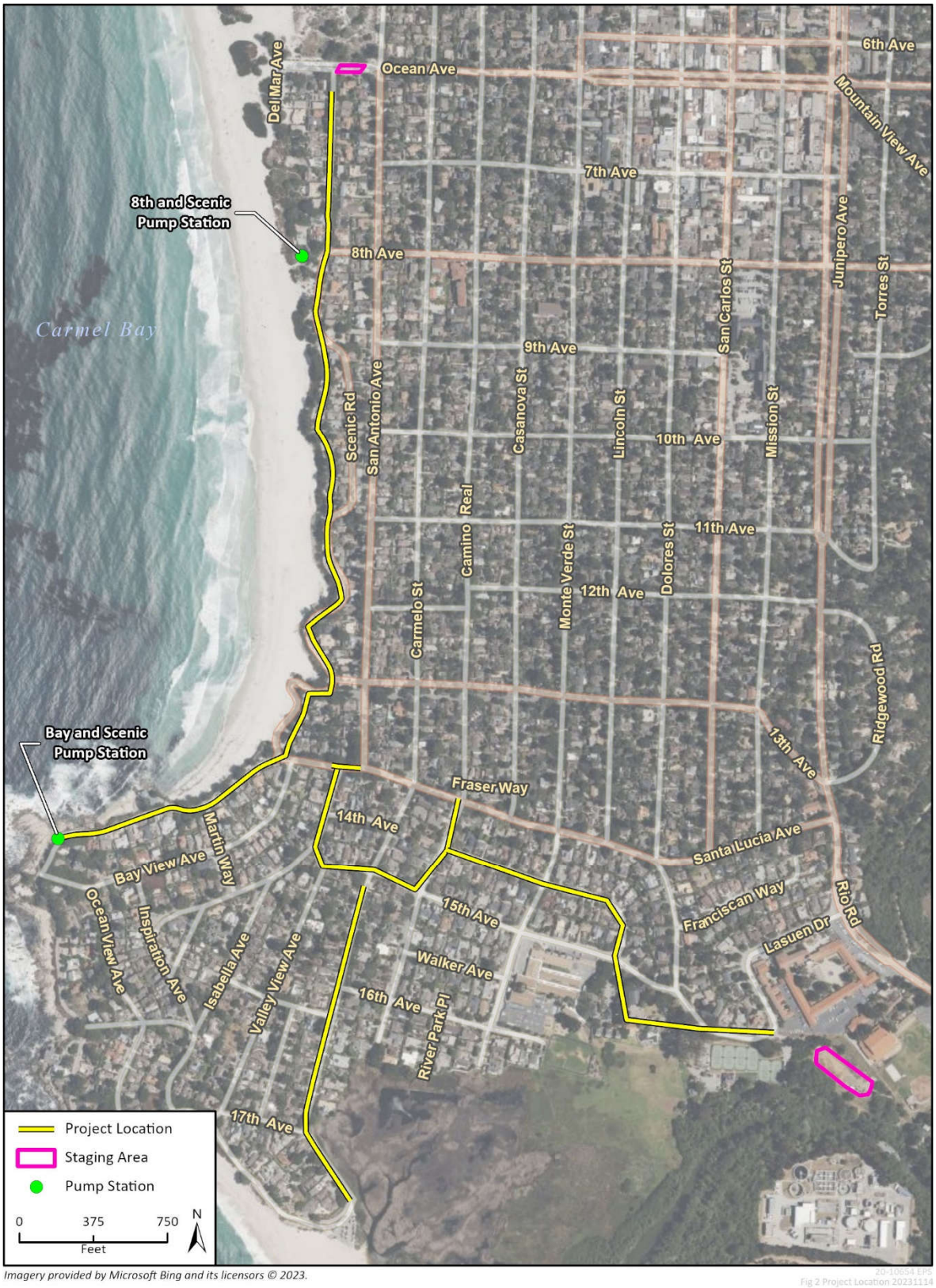


Figure 2 Project Alignment Location



7. Zoning

A majority of the project alignment is located within existing public roadway rights-of-way, which do not have zoning designations within the City or the County (City of Carmel-by-the-Sea 2009a; County of Monterey 2023a). In the County, a portion of the project alignment within the Mission ranch hotel and restaurant property is zoned as Medium Density Residential (County of Monterey 2022). The entire project alignment is located within the Coastal Zone (CCC 2023).

8. Description of Project

Project Overview

The project involves replacement of existing sewer mains within the Scenic Road right-of-way between Ocean Avenue and Martin Way in the City, and between Martin Way and the existing Bay and Scenic pump station at Carmel Point in the County. The project also involves replacement of existing sewer mains along Santa Lucia Avenue, San Antonio Avenue, Valley View Avenue, 15th Avenue, Carmelo Street, Camino Real, 14th Avenue, and Dolores Street, and private property associated with the Mission Ranch hotel and restaurant in the County. Table 1 shows the project alignment distances on each roadway, as well as on the Mission Ranch hotel and restaurant property.

Table 1 Project Alignment Breakdown

Location	Linear Distance (miles)	Linear Distance (feet)
Scenic Road	0.935	4,937
Santa Lucia Avenue	0.028	148
San Antonio Avenue	0.080	422
Valley View Avenue	0.020	106
15th Avenue	0.093	491
Carmelo Street	0.321	1,695
Camino Real	0.100	528
14th Avenue	0.221	1,167
Dolores Street	0.067	354
Mission Ranch hotel and restaurant	0.135	713
Total (approximate)	**2.0 miles**	**10,561 feet**

No trees would be removed as a result of project implementation. The purpose of the project is to replace aging wastewater infrastructure and improve the long-term reliability of the wastewater system. The improvements are not intended to increase conveyance capacity.

Construction

Pipe Bursting

The replacement of the existing gravity sewer main along Scenic Road would be constructed primarily via pipe bursting,[1] which would result in limited surface disturbance. This includes replacement of approximately 0.9 mile of existing gravity sewer main between Ocean Avenue and Martin Way in the City and 0.1 mile between Martin Way and the existing Bay and Scenic pump station at Carmel Point in the County. Approximately 0.3 mile of pipe bursting would also be conducted along Camino Real, 14th Avenue, Dolores Street, and the Mission Ranch parking lot.

Open Trench Excavation

Up to 30 feet of open trench construction[2] (between 5 to 15 feet in depth) would be required at up to 20 manholes, in each direction, along Scenic Road for pipe bursting access. In addition, approximately 0.17 mile of trenching may be required at four locations along Scenic Road where the existing pipeline has sags and repairs to the pipe following pipe bursting may be required. Approximately 0.07 mile of open trenching may be required at one location along Scenic Road; however, the project contractor would also have the option to construct via pipe bursting in this location. The project also includes lining or replacement of existing manholes along Scenic Road. In addition, excavations of between 5 to 10 feet in depth would be required at six locations along Scenic Road for installation of new manholes. All excavation would be within roadway right-of-way and within soils that were previously disturbed during installation of the existing pipeline. Scenic Road would be repaired prior to completion of construction.

The replacement of approximately 30 feet of existing force main on Santa Lucia Avenue and approximately 0.78 mile of existing gravity sewer mains along San Antonio Avenue, Valley View Avenue, 15th Avenue, Carmelo Street, Camino Real, 14th Avenue, and Dolores Street in the County would occur by open trench excavation. All manholes along this portion of the project alignment would be replaced in full or partially replaced (i.e., the frame and cover would be replaced). Excavation would range from 5 to 18 feet in depth. All excavation would be within roadway right of way and within soils that were previously disturbed during installation of the existing pipeline. All roads would be repaired prior to completion of construction.

Lateral Reconnections

There are existing sewer laterals located along the project alignment that connect each home to the sewer main. A total of 222 lateral connections would be required on streets where sewer line replacement would occur (comprised of 119 at pipe bursting locations and 103 at open trench locations). Along Scenic Road, Camino Real, and Dolores Street, where construction would occur primarily by pipe bursting, excavation of up to 15 feet in depth would be required at approximately 119 locations to connect the existing sewer laterals to the new pipeline (comprised of 109 on Scenic Road, 9 on Camino Real, and 1 on Dolores Street). Along Santa Lucia Avenue, San Antonio Avenue, Valley View Avenue, 15th Avenue, and Carmelo Street, where construction would occur by open trench excavation, additional excavation for the 103 lateral reconnections would not be required.

[1] Pipe bursting is a trenchless method of replacing buried pipelines that involves breaking and expanding the existing buried sewer line while simultaneously replacing it with new pipe, which is fed through the existing pipe. Launching and receiving pits are excavated at each end of the pipe; however, a traditional construction trench is not required along the majority of the pipe alignment.

[2] Open trench construction involved excavating down to and exposing the existing pipe so that it can be repaired or replaced and then backfilled with soil.

Staging Areas

The project would utilize two staging areas during construction for storage of construction materials, equipment, and vehicles. The northern staging area would be located at the Ocean Avenue Beach parking lot at the north end of Scenic Road and would require the temporary use of up to 16 parking spaces from January to April 2025. The southern staging area is located to the southeast of the project alignment, in a previously disturbed vacant lot north of the CAWD Wastewater Treatment Plant and south of the Carmel Mission Basilica Museum. No grading would be required within the staging areas. The staging areas are depicted in Figure 2. Additionally, approximately four street parking spaces would be utilized within road closure areas for staging. These staging areas would move as work areas move along the project alignment.

Lane and Road Closures

Full or partial intermittent road closure of Scenic Road, 8th Avenue, Santa Lucia Avenue, San Antonio Avenue, Valley View Avenue, 15th Avenue, 14th Avenue, Camino Real, Dolores Street, and Carmelo Street would be required during normal working hours during construction. Construction and potholing would require up to nine days of closure on Scenic Road from Ocean Avenue to 8th Avenue; up to 20 days of closure from 8th Avenue to 13th Avenue; and up to 17 days of closure from 13th Avenue and Bay Avenue. Construction and potholing on 14th and 15th Avenues would require up to 5 days of closure. Construction and potholing would require one day of closures on Santa Lucia Avenue, San Antonio Avenue, and Valley View Avenue, and up to two days of closure on Camino Real and Dolores Street. Construction would be phased and closures would only apply to the areas being affected at the time. Residents would be provided vehicular access to their properties during construction activities except during road resurfacing. However, replacement of the sewer mains and reconnection of the sewer laterals would require portions of the roads in the project alignment to be shut down to all non-resident through traffic. Local traffic would be allowed to access their driveways during construction, but street parking would not be available during street closures. Residents would have to park in their driveway or outside the road closure area. However, during roadway resurfacing, access to each individual residence would be unavailable for up to 2 days on Scenic Road between 8th Street and Bay View Avenue, and for up to 1 day along the remainder of the project alignment. Durations of road closures during construction activities, potholing, and road resurfacing are shown in Table 2 through Table 4.

Access to the Carmel River Elementary School would be maintained, including during the normally scheduled drop-off and pick-up times. No closures on primary access routes to the school would be allowed during drop-off and pick-up times. Access to the Mission Ranch hotel and restaurant would be maintained; however approximately 5 parking spaces may be disrupted to accommodate the pipe bursting access pits, minor open trench construction, open trench excavation around manholes, and the relocation of one manhole.

Table 2 Road Closure Summary for Construction Activities

Street	Start Station	End Station	Type of Closure	# of Days of Closures
Scenic - Ocean Avenue to 8th Avenue	51+55.30	59+63.58	Resident Only Traffic	6
Scenic - 8th Avenue to 13th Avenue	27+47.92	51+55.30	Resident Only Traffic	17
Scenic - 13th Avenue to Bay View Avenue	10+25.25	27+47.92	Resident Only Traffic	14
Santa Lucia Avenue	100+00.00	101+14.64	One-Lane Closure	0
San Antonio Avenue	101+14.64 200+60.00	105+39.53 201+00.00	One-Lane Closure	0
Valley View Avenue	105+39.53	106+46.31	One-Lane Closure	0
15th Avenue	106+46.31 134+00.00	111+37.51 134+70.00	Resident Only Traffic	4
14th Avenue	122+64.41	134+00.00	Resident Only Traffic	4
Camino Real	111+37.51 120+00.00	113+97.00 122+67.41	Resident Only Traffic	1
Dolores Street	141+26.54	145+20.26	Resident Only Traffic	1
Carmelo Street	150+00.00	166+93.82	One-Lane Closure	0

Table 3 Road Closure Summary for Potholing

Street	Type of Closure	Notes	# of Days of Closures
Scenic Road	Resident Only Traffic	Potholes (est. 17)	3
Santa Lucia Avenue	Resident Only Traffic	Potholes (est. 2)	1
San Antonio Avenue	Resident Only Traffic	Potholes (est. 4)	
Valley View Avenue	Resident Only Traffic	Potholes (est. 1)	
15th Avenue	Resident Only Traffic	Potholes (est. 5)	1
14th Avenue	Resident Only Traffic	Potholes (est. 4)	1
Camino Real	Resident Only Traffic	Potholes (est. 3)	
Dolores Street	Resident Only Traffic	Potholes (est. 2)	0.5
Carmelo Street	One-Lane Closure	Potholes (est. 26)	0

Table 4 Road Closure Summary for Paving

Street	Type of Closure	Notes	# of Days of Closures At Each Residence
Scenic - Ocean Avenue to 8th Avenue	Full Closure	Pavement Resurfacing, Full-width	1
Scenic - 8th Avenue to 13th Avenue	Full Closure	Pavement Resurfacing, Full-width	2
Scenic - 13th Avenue to Bay View Avenue	Full Closure	Pavement Resurfacing, Full-width	2
Santa Lucia Avenue	Full Closure	Pavement Resurfacing, Full-width	1
San Antonio Avenue	Full Closure	Pavement Resurfacing, Full-width	1
Valley View Avenue	Full Closure	Pavement Resurfacing, Full-width	1
15th Avenue	Full Closure	Pavement Resurfacing, Full-width	1
14th Avenue	Full Closure	Pavement Resurfacing, Full-width	1
Camino Real	Full Closure	Pavement Resurfacing, Full-width	1
Mission Ranch	Partial Closure	Pavement Resurfacing, Full-width	1
Dolores Street	Full Closure	Pavement Resurfacing, Full-width	1
Carmelo Street	Full Closure	Pavement Resurfacing, Full-width	1

Wastewater Service Disruption

For laterals directly connected to the main sewer line, there would be short disruptions of wastewater service during lateral reconnection of four hours or less per lateral.

To maintain service during pipe bursting activities along Scenic Road and near Carmel River Elementary School and Mission Ranch hotel and restaurant, wastewater would be bypassed around the work area from an upstream manhole through an on-grade pipeline and discharged to a downstream manhole.

During replacement of the section of existing wastewater force main on Santa Lucia Avenue, wastewater would be hauled by truck from the Bay and Scenic Lift Station and discharged to a manhole downstream of the lift station discharge point. The anticipated haul trips are ten trucks per day for two days during the force main replacement.

During open trench excavation along Santa Lucia Avenue, San Antonio Avenue, Valley View Avenue, 15th Avenue, Carmelo Street, Camino Real, and 14th Avenue, two gas or diesel pumps would be utilized to pump and bypass wastewater flows around the work area, which would be discharged to the next downstream pipe segment.

Construction Schedule

Construction is anticipated to start in January 2025 and be completed in September 2025. Construction would be prioritized along Scenic Road to avoid construction in this area during peak summer months. Construction would occur during daytime hours in compliance with the City and County Municipal Codes which restrict construction noise to between the hours of 8:00 a.m. and 6:30 p.m. and the hours of 7:00 a.m. and 9:00 p.m., respectively. Typically, construction work would end no later than 5 p.m. No nighttime construction would occur.

Soil Import and Export

The project would require excavation of between 3,900 and 4,200 cubic yards (cy) of soil. Excavated soil (up to 300 cy) would be reused on-site if feasible. Depending on the composition of the soil,

between 3,900 and 4,200 cy of excavated soil would be disposed of off-site and replaced with imported soil. Imported material is anticipated to be obtained from Granite Rock Quarry. Excess soil is anticipated to be hauled to ReGen Monterey in Marina. Haul routes would be primarily along State Route 1.

Operation and Maintenance

The project includes replacement of existing sewer main pipeline and associated improvements. The project would not increase the overall collection system wastewater conveyance capacity. Additionally, it can be expected that the new pipeline would require less maintenance than the aging infrastructure. Because the project is updating existing infrastructure, it would not require additional CAWD employees to operate and maintain the project improvements.

9. Surrounding Land Uses and Setting

Within the City, the project alignment is primarily within the right-of-way of Scenic Road, which is bordered by single-family residences to the east and Carmel Beach to the west. Carmel Beach is a popular, white sands beach that is zoned as Improved Parklands, and the Park Overlay overlaps with the single-family residences. In addition, there are several hotels in the vicinity of the project. On the northern end of the project alignment, there are hotels approximately 200 feet to the west, 350 feet to the east, and 650 feet to the east of Scenic Road. On the southern end, there are two hotels, 750 feet and 200 feet to the east of the project alignment.

Within the County, the project alignment is within the right-of-way of Scenic Road, Santa Lucia Avenue, San Antonio Avenue, Valley View Avenue, 15th Avenue, Carmelo Street, Camino Real, 14th Avenue, and Dolores Street. The majority of the project alignment is bordered by single-family residences, with the exception of the southern portion Carmelo Street, which is bordered to the east by the wetlands and coastal strands associated with the Carmel River. The Mission Ranch hotel and restaurant is located adjacent to the project alignment just south of 14th Avenue. The Carmel Mission Basilica Museum is adjacent to the eastern project alignment along Dolores Street and north of the CAWD Wastewater Treatment Plant staging area.

10. Other Public Agencies Whose Approval is Required

The project requires approval of a Coastal Development Permit from the City of Carmel-by-the-Sea and the County of Monterey. The project also requires encroachment permits from the City of Carmel-by-the-Sea and the County of Monterey. The California State Water Resources Control Board (SWRCB) would approve coverage under the National Pollutant Discharge Elimination System (NPDES) Construction General Permit.

11. Have California Native American Tribes Traditionally and Culturally Affiliated with the Project Area Requested Consultation Pursuant to Public Resources Code Section 21080.3.1?

The following tribes were contacted for the project:

- Amah Mutsun Tribal Band
- Amah Mutsun Tribal Band of Mission San Juan Bautista
- Costanoan Ohlone Rumsen-Mutsen Tribe
- Costanoan Rumsen Carmel Tribe
- Esselen Tribe of Monterey County
- Indian Canyon Mutsun Band of Costanoan
- Ohlone/Costanoan-Esselen Nation
- Wuksache Indian Tribe/Eshom Valley Band
- KaKoon Ta Ruk Band of Ohlone-Costanoan Indians of the Big Sur Rancheria
- Rumsen Am:a Tur:ataj Ohlone

Letters were sent on July 27, 2023 via United States Postal Service Certified Mail and email. Follow-up emails were sent on August 11, 2023.

The Ohlone/Costanoan-Esselen Nation (OCEN) and the Esselen Tribe of Monterey County requested consultation with CAWD pursuant to Public Resources Code Section 21080.3.1 and suggested cultural resources training and monitoring occur during project construction. Additionally, the KaKoon Ta Ruk Band of Ohlone-Costanoan Indians of the Big Sur Rancheria responded with a request to include cultural monitors during project construction and ground disturbance, and to incorporate the tribe's Treatment Protocol into the mitigation measures for this Initial Study-Mitigation Negative Declaration (IS-MND). No other responses were received from other tribes, and the consultation window closed on August 26, 2023. Refer to Section 18, *Tribal Cultural Resources,* for a full discussion of consultation and potential project impacts to tribal cultural resources.

Environmental Factors Potentially Affected

This project would potentially affect the environmental factors checked below, involving at least one impact that is "Potentially Significant" or "Less than Significant with Mitigation Incorporated" as indicated by the checklist on the following pages.

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

Determination

Based on 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.

■ 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 to 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 "less than significant with mitigation incorporated" 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 potential 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

4/15/24

Date

Patrick Treanor, P.E.

Printed Name

District Engineer

Title

Environmental Checklist

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?	☐	■	☐	☐
b. Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	■
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a 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?	☐	■	☐	☐
d. Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	☐	☐	■	☐

a. Would the project have a substantial adverse effect on a scenic vista?

c. Would the project, 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 a 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?

Locations that provide expansive views of a highly valued landscape for the benefit of the general public are considered to be scenic vistas. Scenic vistas may be informally recognized, or officially designated by a public agency. Scenic Road provides expansive views of Carmel Beach, an iconic white sands beach lined with cypress trees within Carmel Bay. Public views from the project alignment along Carmelo Street include Carmel Beach and the Carmel Bay, the Carmel River, and an open space area adjacent to the Carmel River. Partial views of the Carmel Mission and Carmel Bay are visible from a portion of the project alignment along Dolores Street. Along all project alignment roadways, including Scenic Road, Santa Lucia Avenue, San Antonio Avenue, Valley View Avenue,

15th Avenue, Carmelo Street, Camino Real, 14th Avenue, and Dolores Street, public views include single family homes and are typical of low-density residential neighborhoods.

Project construction activities would temporarily affect scenic, public views from Scenic Road, Carmelo Street, and Dolores Street. However, construction impacts would be temporary and limited to the construction period and views would not be blocked entirely due to the linear nature of the project. The southern staging area is not visible from public viewpoints, and therefore staging activities at that location would not result in impacts to public views. Staging activities at the northern staging area have the potential to result in potentially significant impacts to scenic views and the quality of public views due to its location along Scenic Road and the visibility of Carmel Beach from the surrounding vicinity. Though temporary, Mitigation Measure AES-1 would be required, which would minimize the visual impacts of project construction by visually screening the northern staging area.

In operation, the replaced sewer mains would be located entirely underground, and the project alignment would not be substantially visibly altered in comparison to existing conditions as it would be repaved. The project would not include tree removal or other substantial or permanent alterations to the project alignment. Therefore, operational impacts related to scenic vistas or public views would be less than significant.

Mitigation Measures

AES-1 Construction Disturbance Minimization

The project contractor shall be responsible for erecting a construction fence screen surrounding the northern construction staging area to block views of staged materials and equipment. The screen fabric shall be designed to color-correspond with the coastal scenery or serve as a canvas for a coordinated graphic arts program. The screen shall be in place during use of the northern staging area, and may be removed when the once northern construction staging area is vacated.

Significance After Mitigation

Implementation of Mitigation Measure AES-1, which requires visual screening of the northern staging area, would reduce temporary project related impacts to public views during construction to a less than significant level.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

b. Would the project substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

The nearest State Scenic Highway designated by the California Department of Transportation (Caltrans) is State Route 1, which is located approximately one mile east of the project alignment (Caltrans 2023). The project alignment is not visible from the highway due to intervening topography and development; therefore, physical changes to the project alignment as a result of the project would not have any effect on views within a state scenic highway. There would be no impact.

NO IMPACT

d. Would the project create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?

The proposed pipeline replacement would be entirely underground. Operation of the project would not add reflective surfaces, such as windows or car windshields, to the project alignment or its surroundings that would result in glare impacts. Glare resulting from construction equipment and construction vehicle windshields would be minimal and temporary in nature. Project construction would not occur at night. Therefore, the project would not create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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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 maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	■
b. Conflict with existing zoning for agricultural use or a Williamson Act contract?	☐	☐	☐	■
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)); timberland (as defined by Public Resources Code Section 4526); or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	■
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	■
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?	☐	☐	☐	■

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

e. Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?

The project alignment and surrounding area do not contain land designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance by the California Department of Conservation (DOC) Farmland Mapping and Monitoring Program (DOC 2023a). The project would

involve the replacement of an existing pipeline within predominantly residential areas in the City and the County, and would not alter any land use on or near the alignment. There would be no impact.

NO IMPACT

b. Would the project conflict with existing zoning for agricultural use or a Williamson Act contract?

The project alignment is zoned Low Density Residential in the City and Medium Density Residential in the small portion within County jurisdiction. There are no Williamson Act contracts on or near the alignment (Carmel-by-the-Sea 2003a; Monterey County 2010). The proposed project would not require a change in zoning and would not involve a change in land use. Therefore, there would be no impact regarding agricultural zoning or Williamson Act land.

NO IMPACT

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

d. Would the project result in the loss of forest land or conversion of forest land to non-forest use?

e. Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of forest land to non-forest use?

The project alignment and surrounding area are not used for timber production or zoned as forest land or timberland. The area surrounding the project alignment consists of built-up land, including single family residences, the Carmel River Elementary School, the Mission Ranch hotel and restaurant, and the Carmel Mission. Tree removal would not occur. The project would not conflict with zoning for forest land, would not result in loss of forest land, and would not change the environment in a manner that would result in conversion of forest land to non-forest use. Therefore, there would be no impact.

NO IMPACT

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?	☐	☐	■	☐
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	■	☐
c. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	■	☐
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	■	☐

Overview of Air Pollution

The federal and State Clean Air Acts (CAA) mandate the control and reduction of certain air pollutants. Under these laws, the U.S. Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB) have established the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS) for "criteria pollutants" and other pollutants. Some pollutants are emitted directly from a source (e.g., vehicle tailpipe, an exhaust stack of a factory, etc.) into the atmosphere, including carbon monoxide (CO), volatile organic compounds (VOC)/reactive organic gases (ROG),[3] nitrogen oxides (NO_X), particulate matter with diameters of ten microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$), sulfur dioxide, and lead. Other pollutants are created indirectly through chemical reactions in the atmosphere, such as ozone, which is created by atmospheric chemical and photochemical reactions primarily between VOC and NO_X. Secondary pollutants include oxidants, ozone, and sulfate and nitrate particulates (smog).

Air pollutant emissions are generated primarily by stationary and mobile sources. Stationary sources can be divided into two major subcategories:

- Point sources occur at a specific location and are often identified by an exhaust vent or stack. Examples include boilers or combustion equipment that produce electricity or generate heat.

[3] CARB defines VOC and ROG similarly as, "any compound of carbon excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate," with the exception that VOC are compounds that participate in atmospheric photochemical reactions. For the purposes of this analysis, ROG and VOC are considered comparable in terms of mass emissions, and the term VOC is used in this IS-MND.

- Area sources are widely distributed and include such sources as residential and commercial water heaters, painting operations, lawn mowers, agricultural fields, landfills, and some consumer products.

Mobile sources refer to emissions from motor vehicles, including tailpipe and evaporative emissions, and can also be divided into two major subcategories:

- On-road sources may be legally operated on roadways and highways.
- Off-road sources include aircraft, ships, trains, and self-propelled construction equipment.

Air pollutants can also be generated by the natural environment, such as when high winds suspend fine dust particles.

Air Quality Standards and Attainment

The project site is located in the North Central Coast Air Basin, which is under the jurisdiction of the Monterey Bay Air Resources District (MBARD). As the local air quality management agency, MBARD is required to monitor air pollutant levels to ensure that the NAAQS and CAAQS are met and, if they are not met, to develop strategies to meet the standards. Depending on whether the standards are met or exceeded, the North Central Coast Air Basin is classified as being in "attainment" or "nonattainment." In areas designated as non-attainment for one or more air pollutants, a cumulative air quality impact exists for those air pollutants, and the human health impacts associated with these criteria pollutants are already occurring in that area as part of the environmental baseline condition. Under state law, air districts are required to prepare a plan for air quality improvement for pollutants for which the district is in non-attainment. The North Central Coast Air Basin is currently designated nonattainment-transitional for the ozone CAAQS and nonattainment for the PM_{10} CAAQS but is either unclassified or designated attainment for all other NAAQS and CAAQS (CARB 2023).[4] The health effects associated with criteria pollutants for which the North Central Coast Air Basin is in non-attainment are described in Table 5.

Table 5 Health Effects Associated with Non-Attainment Criteria Pollutants

Pollutant	Adverse Effects
Ozone	(1) Short-term exposures: (a) pulmonary function decrements and localized lung edema in humans and animals and (b) risk to public health implied by alterations in pulmonary morphology and host defense in animals; (2) long-term exposures: risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (3) vegetation damage; and (4) property damage.
Nitrogen Dioxide (NO_2)	(1) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (2) risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and (3) contribution to atmospheric discoloration.
Suspended particulate matter (PM_{10})	(1) Excess deaths from short-term and long-term exposures; (2) excess seasonal declines in pulmonary function, especially in children; (3) asthma exacerbation and possibly induction; (4) adverse birth outcomes including low birth weight; (5) increased infant mortality; (6) increased respiratory symptoms in children such as cough and bronchitis; and (7) increased hospitalization for both cardiovascular and respiratory disease (including asthma).

Source: USEPA 2023a

[4] A region is designated nonattainment-transitional for ozone when the standard has not been exceeded on more than three days at any one location during the last year.

Air Quality Management

The California Clean Air Act requires each air district with jurisdiction over a nonattainment area in the state to adopt a plan showing how the CAAQS for the ozone will be met. Most recently, MBARD adopted the 2012-2015 Air Quality Management Plan (2015 AQMP) to demonstrate a pathway for the region to make progress toward meeting the ozone CAAQS. Reducing NO_X emissions is crucial for reducing ozone formation and given that the primary sources of NO_X emissions are mobile sources, the 2015 AQMP primarily includes measures to reduce NO_X emissions, focusing on on-road and off-road vehicles (MBARD 2017).

Air Pollutant Emission Thresholds

The MBARD (2008) *CEQA Air Quality Guidelines* provide a list of construction and operational air pollutant emissions thresholds as well as a list of mitigation measures to incorporate in circumstances where emissions are above applicable thresholds (MBARD 2008).

Table 6 presents MBARD's project-level significance thresholds for construction and operational criteria air pollutant and precursor emissions. These represent levels at which a project's individual emissions of criteria air pollutants or precursors would result in a cumulatively considerable contribution to the North Central Coast Air Basin's existing air quality conditions. For the purposes of this analysis, the project would result in a significant impact if construction or operational emissions from the project would exceed the thresholds shown in Table 6.

Table 6 Air Quality Thresholds of Significance

Pollutant	Source	Threshold of Significance
Construction Impacts		
PM_{10}	Direct	82 lbs/day[1]
Operational Impacts		
VOC	Direct and Indirect	137 lbs/day
NO_X	Direct and Indirect	137 lbs/day
PM_{10}	On-site	82 lbs/day[2]
CO	N/A	LOS at intersection/road segment degrades from LOS D or better to LOS E or F or V/C ratio at intersection/road segment at LOS E or F increases by 0.05 or more or delay at intersection at LOS E or F increases by 10 seconds or more or reserve capacity at unsignalized intersection at LOS E or F decreases by 50 or more
	Direct	550 lbs/day[3]
SO_X, as SO_2	Direct	150 lbs/day

lbs/day = pounds per day; PM_{10} = particulate matter with a diameter of 10 microns or less; VOC = volatile organic compounds (also referred to as ROG, or reactive organic gases); NO_X = oxides of nitrogen; CO = carbon monoxide; SO_X = oxides of sulfur; SO_2 = sulfur dioxide; LOS = level of service, V/C = volume-to-capacity

[1] This threshold only applies if construction is located nearby or upwind of sensitive receptors. In addition, a significant air quality impact related to PM_{10} emissions may occur if a project uses equipment that is not "typical construction equipment" as specified in Section 5.3 of the MBARD (2008) *CEQA Air Quality Guidelines*.

[2] MBARD's operational PM_{10} threshold of significance applies only to on-site emissions, such as project-related vehicle trips along on-site unpaved roads. These impacts are generally less than significant. However, for large development projects, even if almost all travel is on paved roads, entrained road dust from vehicular travel can exceed the significance threshold.

[3] Modeling should be undertaken to determine if the project would cause or substantially contribute (550 pounds per day) to exceedance of the carbon monoxide ambient air quality standards. If not, the project would not have a significant impact.

Source: MBARD 2008

Methodology

Air pollutant emissions generated by project construction and operation were estimated using the California Emissions Estimator Model (CalEEMod), version 2022.1.1.17. CalEEMod uses project-specific information, including the project's land uses, location, and construction parameters, to model project emissions. The analysis reflects the construction and operation of the project as described under *Description of Project*.

Construction emissions modeled include emissions generated by construction equipment used on-site and emissions generated by vehicle trips associated with construction, such as worker, vendor, water truck, and haul trips. CalEEMod assumes 55 percent paved roads in MBARD's jurisdiction. However, project construction would occur fully on paved roads; therefore, this value was modified to reflect project conditions more accurately. Construction of the proposed project was analyzed based on the construction schedule and construction equipment list provided by the project's engineering and design team. Construction would begin in January 2025 and occur over the course of approximately nine months with work occurring Monday through Friday. Project construction would include site preparation, pipe bursting, open-trench pipeline installation, replacement/rehabilitation of existing manholes, minor lift station improvements, and paving. It is assumed all construction equipment would be diesel-powered. The project would require excavation of between 3,900 and 4,200 cy of soil. Excavated soil (up to 300 cy) would be reused on-site if feasible. Depending on the composition of the soil, between 3,900 and 4,200 cy of excavated soil would be disposed of off-site and replaced with imported soil. To provide a conservative estimate, this analysis assumes a maximum of approximately 4,200 cubic yards of soil would be imported and 4,200 cubic yards would be exported during project construction.

As stated in *Description of Project,* the operation and maintenance needs of the sewer main would not increase as compared to the existing pipeline. The project would not increase the overall collection system wastewater conveyance capacity. Additionally, it can be expected that the new pipeline would require less maintenance than the aging infrastructure due to the improved condition of the pipeline after replacement. Because the project is updating existing infrastructure, it would not require additional CAWD employees to operate and maintain the project improvements. Therefore, emissions from operations and maintenance would be similar or less than existing operations. As such, operational impacts are discussed qualitatively in this analysis.

a. Would the project conflict with or obstruct implementation of the applicable air quality plan?

A project would conflict with or obstruct implementation of the 2015 AQMP if either it induced population such that the population of unincorporated Monterey County exceeds the population forecast for the appropriate five-year increment utilized in the 2015 AQMP or if construction and operational emissions of ozone precursors would exceed MBARD significance thresholds (MBARD 2008).

The proposed project would not increase the conveyance capacity of the CAWD wastewater collection system. The project would update existing infrastructure and is not intended to accommodate future planned or unplanned development. The project would also not directly generate population growth through construction of housing or creation of substantial employment opportunities. Therefore, the project would not directly or indirectly induce population growth such that the population of unincorporated Monterey County would exceed the population forecast utilized in the 2015 AQMP.

MBARD states that construction projects using typical construction equipment that temporarily emit precursors of ozone (VOCs and NO_X) are accommodated in the emission inventories of state and federally-required air plans and would not have a significant impact on the attainment and maintenance of ozone NAAQS or CAAQS (MBARD 2008). The project would involve the use of typical construction equipment; as such, construction-related emissions of VOCs and NO_X would be less than significant. MBARD also states that a project would contribute substantially to a violation of NAAQs or CAAQs if it would emit 82 lbs/day or more of PM_{10} (MBARD 2008). PM_{10} emissions from construction of the project would not exceed MBARD thresholds as shown in Table 7 under item (b) below. Therefore, the proposed project would not conflict with or obstruct the implementation of the applicable air quality plan, and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project 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?

Construction Emissions

Construction activities such as site preparation, construction worker travel to and from the project site, delivery and hauling of construction materials and debris to and from project site, and fuel combustion by on-site construction equipment would generate emissions of ozone precursors (VOC and NO_X), carbon monoxide, and fugitive dust (PM_{10} and $PM_{2.5}$). According to the MBARD guidelines, PM_{10} is typically the greatest pollutant of concern during construction.

The MBARD (2008) *CEQA Air Quality Guidelines* provide project-level thresholds for construction emissions. If a project's construction emissions fall below the project-level thresholds, the project's impacts to regional air quality are considered individually and cumulatively less than significant. Table 7 shows the estimated maximum daily emissions for each year of project construction.

Table 7 Estimated Maximum Daily Construction Emissions (lbs/day)

Construction Year	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
2025	5	34	39	< 1	4	2
Maximum Emissions (lbs/day)	**5**	**34**	**39**	**< 1**	**4**	**2**
MBARD Thresholds	N/A	N/A	N/A	N/A	82[1]	N/A
Threshold Exceeded?	N/A	N/A	N/A	N/A	No	N/A

lbs/day = pounds per day; VOC = volatile organic compounds; NO_X = oxides of nitrogen; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter with a diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with a diameter of 2.5 microns or less; N/A = not applicable

[1] This threshold only applies if construction is located nearby or upwind of sensitive receptors. In addition, a significant air quality impact related to PM_{10} emissions may occur if a project uses equipment that is not "typical construction equipment" as specified in Section 5.3 of the MBARD CEQA Guidelines (2008).

Notes: All numbers have been rounded to the nearest whole number. Emissions modeling was completed using CalEEMod version 2022.1.1.17. See Appendix A for modeling results.

As shown in Table 7, project construction would generate maximum daily PM_{10} emissions of approximately 4 lbs/day, which is well below the MBARD threshold of 82 lbs/day. In addition, MBARD states construction projects using typical construction equipment that temporarily emit precursors of ozone (VOCs and NO_X) are accommodated in the emission inventories of state and federal air plans and would not have a significant impact on the attainment and maintenance of ozone NAAQS or CAAQS (MBARD 2008). The project would involve the use of typical construction equipment; as such, construction-related emissions of VOCs and NO_X would be less than significant. Therefore, project construction would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard, and impacts would be less than significant.

Although construction-related air quality impacts would be less than significant, MBARD recommends the use of the following best management practices for the control of short-term construction emissions (MBARD 2008). These measures were not included in the modeling in order to provide a more conservative estimate of air pollutant emissions. However, if adhered to, these best management practices would further reduce air pollutant emissions:

- Water all active construction areas at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure.
- Prohibit all grading activities during periods of high wind (over 15 miles per hour)
- Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days)
- Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed areas
- Maintain at least two feet of freeboard on haul trucks
- Cover all trucks hauling soil, sand, and other loose materials
- Plant vegetative ground cover in disturbed areas as quickly as possible
- Cover inactive storage piles
- Sweep streets if visible soil material is carried out from the construction site
- Post a publicly visible sign that specifies the telephone number and person to contact regarding dust complaints. This person shall respond to complaints and take corrective action within 48 hours. The phone number of the MBARD shall be visible to ensure compliance with Rule 402 (Nuisance)
- Limit the area under construction at any one time

Operational Emissions

Operation of the project would include routine inspections and maintenance of infrastructure; however, maintenance trips and their associated air pollutant emissions would not increase in comparison to existing conditions. As stated under *Description of Project*, the new pipeline would require fewer maintenance trips than the existing pipeline due to the improved condition after replacement. The project would not introduce new electricity demands or staffing needs. Therefore, project operation would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard, and impacts would be less than significant.

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c. Would the project expose sensitive receptors to substantial pollutant concentrations?

Carbon Monoxide Hotspots

A carbon monoxide hotspot is a localized concentration of carbon monoxide that is above a carbon monoxide ambient air quality standard. Localized carbon monoxide hotspots can occur at intersections with heavy peak hour traffic. Specifically, hotspots can be created at intersections where traffic levels are sufficiently high such that the local carbon monoxide concentration exceeds the federal one-hour standard of 35.0 ppm or the federal and state eight-hour standard of 9.0 ppm (CARB 2022a).

The project would not increase the frequency of operation and maintenance trips needed for the pipeline. Therefore, the project would not result in volumes of traffic that would create, or substantially contribute to, the exceedance of state and federal ambient air quality standards for carbon monoxide. The project would not expose sensitive receptors to substantial pollutant concentrations related to carbon monoxide hotspots, and impacts would be less than significant.

Toxic Air Contaminants

Construction-related activities would result in temporary project-generated emissions of diesel particulate matter (DPM) exhaust emissions from off-road, heavy-duty diesel equipment for demolition, site preparation, trenching, infrastructure installation, paving, and other construction activities. DPM was identified as a toxic air contaminant (TAC) by CARB in 1998 (CARB 2022a).

Generation of DPM from construction projects typically occurs in a single area for a short period. Construction of the proposed project would occur intermittently and in phases (i.e., site preparation, pipeline construction, and paving) over approximately nine months. Additionally, construction equipment would move along the pipeline alignment, and would not operate at any single location for an extended period of time. The dose to which the receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of exposure that person has with the substance. Dose is positively correlated with time, meaning a longer exposure period would result in a higher exposure level for the Maximally Exposed Individual. The risks estimated for a Maximally Exposed Individual are higher if a fixed exposure occurs over a longer period of time. According to the California Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project. Thus, the duration of proposed construction activities (i.e., nine months) is approximately 0.1 percent of the total exposure period used for health risk calculation. Current models and methodologies for conducting health-risk assessments are associated with longer-term exposure periods of 9, 30, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities, resulting in difficulties in producing accurate estimates of health risk (BAAQMD 2017).

Maximum DPM emissions would occur during open trench and trenchless construction activities. DPM emissions would be lower during other construction phases such as paving because some phases would require less construction equipment than others. While the maximum DPM emissions associated with open trench and trenchless construction activities would only occur for approximately 7 months, or 80 percent of the overall construction period, these activities represent the worst-case condition for the total construction period. This would represent less than 0.1 percent of the total exposure period for health risk calculation. Therefore, project construction

activities would not represent the type of long-term TAC emission sources typically subject to health risk assessments. Construction activities would also be subject to and would comply with California regulations limiting the idling of heavy-duty construction equipment to no more than five minutes, which would further reduce nearby sensitive receptors' exposure to temporary and variable DPM emissions. As such, project construction would not expose sensitive receptors to substantial TAC concentrations, and impacts would be less than significant.

The project would not include any mobile or stationary sources of air pollution once operational. Therefore, impacts related to TAC emissions from stationary sources would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

During construction activities, temporary odors would be generated by vehicle exhaust and construction equipment. Construction-related odors would be short-term and would cease upon completion. In addition, MBARD Rule 402 prohibits the discharge of air contaminants or other emissions that would cause a nuisance or detriment to a considerable number of persons or to the public, except for odors from agricultural activities. Compliance with Rule 402 is required and would further reduce construction odor impacts. Therefore, project construction would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people, and impacts would be less than significant.

Land uses typically producing odorous emissions include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding (MBARD 2008). The project includes replacement and rehabilitation of existing wastewater conveyance facilities that are primarily located underground and are sealed, which would reduce the potential for odorous emissions. Minor quantities of odorous emissions may be released along the pipeline alignment from vents and release valves. However, these odor sources are not new to the project area, and emissions would be temporary and limited to the immediate vicinity. Therefore, project operation would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people, and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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 Wildlife or U.S. Fish and Wildlife Service?	☐	■	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	■	☐	☐
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	■	☐	☐
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	■
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	■	☐	☐
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	■

Regulatory Setting

Regulatory authority over biological resources is shared by federal, State, and local authorities under a variety of statutes and guidelines. Primary authority for general biological resources lies within the land use control and planning authority of local jurisdictions (in this instance, Carmel-by-the-Sea and Monterey County). The California Department of Fish and Wildlife (CDFW) is a trustee agency for biological resources throughout the State under CEQA and also has direct jurisdiction over certain biological resources under the California Fish and Game Code (CFGC). Under the California Endangered Species Act (CESA) and federal Endangered Species Act (FESA), the CDFW and the U.S. Fish and Wildlife Service (USFWS), respectively, have direct regulatory authority over species formally listed as Threatened or Endangered. The USFWS also has regulatory authority over native bird species listed under the Federal Migratory Bird Treaty Act (MBTA) and Bald and Golden Eagle Protection Act (BGEPA). The U.S. Army Corps of Engineers (USACE) has regulatory authority over specific biological resources, namely waters of the United States, under Section 404 of the federal Clean Water Act (CWA). The CDFW and Regional Water Quality Control Boards (RWQCBs) protect waters and streambeds at the State level. The analysis herein is guided by the requirements of these laws, and by the operating standards of the implementing agencies.

Carmel-by-the-Sea General Plan and Local Coastal Program

The City of Carmel-by-the-Sea's General Plan is combined with the Local Coastal Land Use Plan (LUP) and includes goals and policies to preserve coastal environmental resources, including Environmentally Sensitive Habitat Areas (ESHAs) (Carmel-by-the-Sea 2003b). Along Carmel Beach and ocean shoreline, ESHAs are located on both sides of Ocean Avenue, north of 8th Avenue (Carmel-by-the-Sea 2003b). The Coastal Resource Management Element (CRME) contains goals, objectives, and policies relevant to biological resources, including:

G5-2: Establish and implement a comprehensive shoreline management program for the beach, bluffs and dunes that mitigates degradation caused by public use and natural forces. (LUP)

- **O5-4:** Maintain the vegetation and trees along the shoreline in a safe and healthy condition. (LUP)

G5-4: Preserve and enhance the City's legacy of an urbanized forest of predominantly Monterey pine, coast live oak and Monterey Cypress. (LUP)

  - **P5-183:** Promote the placement of utilities underground where feasible and with minimum detriment to the root system of trees. (LUP)
  - **P5-103:** Identify and protect environmentally sensitive habitat areas against any significant disruption of habitat values. Only uses dependent upon those resources shall be allowed. For private lots of record within ESHA, establish a transfer of development rights program using credits of water, floor area, density or some other development parameter to relocate development to less sensitive areas. (LUP)
  - **P5-104:** Preserve and protect wetlands. (LUP)

G5-12: Identify, protect and manage Environmentally Sensitive Habitat Areas (ESHAs) to ensure their long-term integrity and the biological productivity of these habitats. (LUP)

  - **P5-161:** Avoid disturbance or degradation of resources when maintenance vehicles and equipment enter sensitive habitat areas. (LUP)

Carmel-by-the-Sea Municipal Code

Chapter 17.48.050 of the City's municipal code requires a permit for trees on private property for any alteration that would remove roots greater than two inches in diameter, and any tree on public property where pruning or root removal is proposed. Permit application requirements include the number, size, and species of tree roots to be removed. Section 17.48.110 also requires protection of trees during construction, including protection of tree roots from drying out during excavation, and any trimming cuts are required to conform to arboricultural standards.

Monterey County Carmel Area Land Use Plan

The Monterey County Carmel Area Land Use Plan (LUP) includes policies to protect sensitive biological resources, ESHA, and protected trees, that are appliable to the project, including:

2.3.3 General Policies

1. Development, including vegetation removal, excavation, grading, filling, and the construction of roads and structures, shall be avoided in critical and sensitive habitat areas, riparian corridors, wetlands, sites of known rare and endangered species of plants and animals, rookeries and major roosting and haul-out sites, and other wildlife breeding or nursery areas identified as critical. Resource-dependent uses, including nature education and research, hunting, fishing, and aquaculture, shall be allowed within environmentally sensitive habitats and only if such uses will not cause significant disruption of habitat values. Only small-scale development necessary to support the resource-dependent uses may be located in sensitive habitat areas if they cannot feasibly be located elsewhere. Wetlands are defined as lands which may be covered periodically or permanently with shallow water and include saltwater marshes, fresh water marshes, open or closed brackish water marshes, swamps, mudflats and fens.

Monterey County Municipal Code

Section 21.64.260 of Monterey County's municipal code provides for the preservation of oaks and other protected trees. This code requires a permit from the County for the removal of trees in unincorporated areas designated as resource conservation, residential, commercial, or industrial. It also prohibits the removal of landmark trees, unless approved by the Director of Planning.

Methodology

The analysis of impacts to biological resources is based on a review of relevant literature and database query results, a field reconnaissance survey to determine what sensitive biological resources do or may occur within the project alignment, and an evaluation of the proposed activity in the context of potentially occurring biological resources to determine potentially significant impacts under CEQA. The potential presence of special-status species and/or other sensitive biological resources (e.g., wetlands, native trees, ESHAs) is based on the literature review and a field survey designed to assess habitat suitability for special-status species and presence or absence of such species as well as other sensitive biological resources. The potential for impacts to these species and/or their habitats as well as other sensitive biological resources was evaluated based on this methodology in addition to the project description and known construction activities associated with the installation of new sewer line.

Literature Review

Rincon reviewed relevant databases and literature for baseline information on biological resources occurring and potentially occurring at the project alignment and in the immediate surrounding area. The review included the following sources:

- Information for Planning and Consultation (IPaC; USFWS 2023a)
- California Natural Diversity Database (CNDDB) for the Monterey, California United States Geological Survey (USGS) 7.5-minute quadrangle and four surrounding quadrangles (CDFW 2023a)
- Online Inventory of Rare and Endangered Plants (California Native Plant Society [CNPS] 2023a)
- National Hydrography Dataset (NHD; USGS 2023)
- National Wetlands Inventory (NWI; USFWS 2023b)
- Web Soil Survey (United States Department of Agriculture, Natural Resources Conservation Services [USDA, NRCS] 2023a)

The CNDDB (CDFW 2023a) was reviewed for recorded occurrences of special-status plant and wildlife taxa in the region prior to conducting a reconnaissance-level field survey (described below). For this review, the search included all occurrences within the USGS 7.5-minute topographic quadrangle encompassing the project alignment (*Monterey*), and the four surrounding terrestrial quadrangles (*Seaside*, *Mt. Carmel*, *Marina*, and *Soberanes Pt.*). The area to the west of the project alignment consists of the Pacific Ocean and does not contain topographic quadrangles.

Biological Surveys

Reconnaissance-level site visits were conducted to assess the habitat suitability for special-status species, evaluate and map vegetation communities and land cover types, document and map the presence of any sensitive biological resources, identify potentially jurisdictional waters or wetlands, document any wildlife connectivity/movement features, and record all observation of plant and wildlife species within the project site. Rincon conducted a site visit of the portion of the alignment along Scenic Road, between Ocean Avenue and Ocean View Avenue, and the northern staging area, on July 19, 2021, between the hours of 8:59 and 9:49 a.m. The survey consisted of a combination of windshield and pedestrian transects over the entire project site, inspecting the site for the potential to support special-status species or other sensitive biological resources. Two additional surveys were conducted for areas added to the project after the initial survey. The southern staging area and alignment between Santa Lucia Avenue, 14th Avenue, and Carmelo Street was surveyed on March 29, 2022 between the hours of 9:16 and 10:00 a.m., and the alignment south of 14th Street and Dolores Street was surveyed on August 29, 2023 between the hours of 1:40 and 2:10 p.m.

Topography and Soils

The project alignment is at an elevation of approximately 10 feet above mean sea level, and the site topography is relatively flat. The project alignment contains the following soil map unit (USDA, NRCS 2023a): Aquic Xerofluvents; Baywood sand, 2 to 15 percent slopes; Coastal beaches; Dune land; Elder very fine sandy loam, 2 to 9 percent slopes; Gorgonio sandy loam, 0 to 5 percent slopes; and Oceano loamy sand, 2 to 15 percent slopes. All of the soils mapped within the site are listed as hydric soils (USDA, NRCS 2023b); however, these soils also occur in upland areas as well as where hydrology and hydrophytic vegetation are not present.

Vegetation Communities and Land Cover Types

The areas encompassing the alignment of the sewer line and northern staging area are completely developed, with paved roads, driveways, and walking trails, as well as landscaped lawns and park strips. The dominant species in the canopy includes ornamental plantings of Monterey cypress (*Hesperocyparis macrocarpa*) and Monterey pine (*Pinus radiata*), with various non-native and ornamental species underneath. The southern staging area is a vacant lot and consists of bare ground and non-native grasses and is currently used as a general staging area for the City. The southern staging area is bordered by arroyo willow (*Salix lasiolepis*) riparian habitat to the south and east, associated with the Carmel River. This community most closely corresponds to the *Salix lasiolepis* Shrubland Alliance (arroyo willow thickets).

Drainages and Wetlands

No drainages or wetlands were observed in the project alignment; however, the site is adjacent to Carmel Beach and Carmel River State Beach, and there are numerous storm water outfalls below the west side of Scenic Road outside the project alignment (Carmel-by-the-Sea 2003b). Additionally, the southern staging area is bordered by arroyo willow thickets and an overflow ditch that are likely jurisdictional.

Special-Status Species

Special-status species are those plants and animals listed, proposed for listing, or candidates for listing as threatened or endangered by the USFWS or National Marine Fisheries Service (NMFS) under the FESA; those listed or proposed for listing as rare, threatened, or endangered by the CDFW under the CESA or Native Plant Protection Act; animals designated as "Species of Special Concern," "Fully Protected," or "Watch List" by the CDFW; and plants with a California Rare Plant Rank (CRPR) of 1 or 2 which are defined as:

- List 1A = Plants presumed extinct in California
- List 1B.1 = Rare or endangered in California and elsewhere; seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)
- List 1B.2 = Rare or endangered in California and elsewhere; fairly endangered in California (20-80 percent occurrences threatened)
- List 1B.3 = Rare or endangered in California and elsewhere, not very endangered in California (<20 percent of occurrences threatened or no current threats known)
- List 2 = Rare, threatened or endangered in California, but more common elsewhere

Special-Status Plants

A review of resource agency databases and lists for known special-status plant species occurrences in the five USGS quadrangles containing and surrounding the project alignment identified 48 regionally occurring special-status plant species (Appendix B). Special-status plant species typically have specialized habitat requirements, including plant community types, soils, and/or elevational ranges. Due to the lack of natural coniferous forest, dune, and maritime chaparral vegetation communities, lack of serpentine, rocky and other specific soils, and high level of urban development, 43 species were eliminated from the potential to occur list. Three special-status plants have a low potential to occur within the project alignment due to the presence of lichens and mosses and suitable coniferous trees adjacent to the project alignment in ornamental plantings: angel's hair lichen (*Ramalina thrausta*, CRPR 2B.1), twisted horsehair lichen (*Sulcaria spiralifera*, CRPR 1B.2), and California screw moss (*Tortula californica*, CRPR 1B.2). These species are not State or federally listed,

and if present, are expected to occur within tree canopies, outside of areas that would be impacted by construction.

The remaining two species evaluated, Monterey cypress and Monterey pine, occur adjacent to the project alignment. Only two native Monterey cypress groves occur in California, within Point Lobos State Reserve and Del Monte Forest (CNPS 2023b), and only three native stands of Monterey pine are known in California, Ano Nuevo, Cambria, and the Monterey Peninsula (CNPS 2023c). When naturally occurring, Monterey cypress and Monterey pine are considered special-status species (CRPR 1B.2 and 1B.1, respectively); however, due to development within the City and the County, the Monterey cypress and Monterey pine within the project alignment are planted, ornamental specimens, or recruited from ornamental plantings. Therefore, they are not considered special-status species.

Special-Status Wildlife

A review of resource agency databases and lists for known special-status wildlife species occurrences in the four USGS quadrangles containing and surrounding the project alignment identified 28 regionally occurring special-status wildlife species. The proposed project components would be located generally along the Scenic Road right-of-way between Ocean Avenue and Martin Way in Carmel-by-the Sea, and between Martin Way and the existing Bay and Scenic pump station at Carmel Point in the County of Monterey. The project alignment is also along Santa Lucia Avenue, San Antonio Avenue, Valley View Avenue, 15th Avenue, Carmelo Street, Camino Real, 14th Avenue, and Dolores Street, and private property associated with the Mission Ranch hotel and restaurant in the County of Monterey. The project alignment consists of paved roads, a parking lot, and regularly maintained landscaping. Given the developed nature of the project alignment in a predominantly urban area, the project alignment and surrounding areas to the east do not provide suitable habitat for special-status wildlife species. To the west of Scenic Road is Carmel Beach, a heavily used recreation area allowing dogs off leash. To the south is the Carmel River; however, no construction activities are proposed within natural habitats. Due to the lack of natural habitats and vegetation communities, and level of urban development, 25 species were eliminated from the potential to occur list. Two special-status species were determined to have a low potential to occur within the project alignment due to the presence of flowering plants adjacent to the project alignment and in bare areas of the southern staging area: western bumble bee (*Bombus occidentalis*, State candidate endangered) and Crotch bumble bee (*Bombus crotchii*, State candidate endangered). The one remaining species, California red-legged frog (*Rana draytonii*, federally threatened), has a moderate potential to occur in the project alignment during upland movement due to the proximity of the southern staging area to arroyo willow thickets associated with the Carmel River. These species are discussed in more detail below.

WESTERN BUMBLE BEE AND CROTCH BUMBLE BEE

The historic range of western bumble bee covered much of the western United States, from the Pacific coast to the Colorado Rocky Mountains, but is currently restricted to high mountain meadows and coastal environments (CDFW 2019). Crotch bumble bee occur in coastal California, including Mediterranean climates, east to the Sierra-Cascade crest and south into Mexico. These species are social insects and utilize small mammal burrows as annual colonies and have a wide variety of plant associations, including maritime chapparal and coastal dune species.

There are two known occurrences of western bumble bee within five miles of the project site, including one non-specific location from Carmel (observed in 1972, CDFW 2023a), and flowering

plants are present. Suitable burrows for bumble bee colonies were not observed and the project alignment is largely developed. Therefore, these species have a low potential to occur within the project alignment while foraging.

CALIFORNIA RED-LEGGED FROG

California red-legged frog occurs in lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. They typically inhabit quiet pools of streams, marshes, and ponds. All life history stages are most likely to be encountered in and around breeding sites, which include coastal lagoons, marshes, springs, permanent and semi-permanent natural ponds, and ponded and backwater portions of streams, as well as artificial impoundments such as stock ponds, irrigation ponds, and siltation ponds. Eggs are typically deposited in permanent pools, attached to emergent vegetation. This species typically requires 11 to 20 weeks of permanent water for larval development and must have access to estivation habitat. Suitable upland habitat must provide sufficient moisture to prevent desiccation and sufficient cover to provide protection from predators. Typical upland habitat consists of downed woody vegetation, leaf litter, and small mammal burrows, densely vegetated areas, and even, man-made structures (e.g., culverts, livestock troughs, spring-boxes, abandoned sheds) (USFWS 2002).

There are 14 known occurrences of this species within five miles of the project site, including sightings in the Carmel River approximately 0.2 mile south of the southern staging area.

Upland habitat within the project alignment is generally marginal and limited to bare ground and non-native grasses at the southern staging area. Most of the project alignment consists of residential areas that are too developed to provide suitable upland habitat; however, the arroyo willow thickets and wetland areas south of the site provide suitable habitat for the species. The species is presumed present in the vicinity of the project alignment and has a moderate potential of occurring within the southern staging area during dispersal in rain events and during nocturnal foraging.

NESTING BIRDS

Native bird nests are protected by CFGC Section 3503. Vegetated areas in the vicinity of the project alignment and staging areas contain suitable nesting habitat for a variety of native avian species, including, but not limited to, house finch (*Haemorhous mexicanus*), black phoebe (*Sayornis nigricans*), American crow (*Corvus brachyrhynchos*), scrub jay (*Aphelocoma californica*), chestnut-backed chickadee (*Poecile rufescens*), yellow-rumped warbler (*Setophaga coronata*), and California towhee (*Melozone crissalis*).

Sensitive Communities and Critical Habitat

Plant communities are considered sensitive biological resources if they have limited distributions, have high wildlife value, include sensitive species, or are particularly susceptible to disturbance. The CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in the CNDDB. The CNDDB vegetation alliances are ranked 1 through 5 based on the NatureServe methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive (Faber-Langendoen, et al 2012). Some alliances with the ranks of 4 and 5 have also been included in the 2023 sensitive natural communities list under the CDFW revised ranking methodology (2023b).

No CDFW sensitive habitats or federally designated critical habitats occur in the project site. However, the southern staging area was identified as ESHA under the LUP (Jones & Stokes Associates, Inc. 1995).

Additionally, the Carmel River (Unit MNT-2) was federally designated as critical habitat for California red-legged frog in 2010 (USFWS 2010). MNT-2 is the largest designated critical habitat unit within Monterey County and contains features that are essential for the conservation of the species, including permanent and ephemeral aquatic habitat for breeding and non-breeding activities, and upland habitat for foraging, dispersal activities, and shelter.

Wildlife Movement Corridors

Wildlife movement corridors, or habitat linkages, are generally defined as connections between habitat patches that allow for physical and genetic exchange between otherwise isolated animal populations. Such linkages may serve a local purpose, such as providing a linkage between foraging and denning areas, or they may be regional in nature. Some habitat linkages may serve as migration corridors, wherein animals periodically move away from an area and then subsequently return. Other corridors may be important as dispersal corridors for young animals. A group of habitat linkages in an area can form a wildlife corridor network.

Habitats within a habitat linkage do not necessarily need to be identical to those habitats being linked. Rather, the linkage needs only to contain sufficient cover and forage to allow temporary utilization by species moving between core habitat areas. Habitat linkages are typically contiguous strips of natural areas, though dense plantings of landscape vegetation can be used by certain disturbance-tolerant species. Some species may require specific physical resources (such as rock outcroppings, vernal pools, or oak trees) within the habitat link for the linkage to serve as an effective movement corridor, while other more mobile or aerial species may only require discontinuous patches of suitable habitat to permit effective dispersal and/or migration. Wildlife movement corridors may occur at either large or small scales.

Wildlife movement corridors can be both large and small scale. Riparian corridors and waterways including those adjacent to the Carmel River provide local-scale opportunities for wildlife movement through the project area. On a larger scale, an Essential Connectivity Area is mapped south of the project alignment in the CDFW Biogeographic Information and Observation System (Spencer et al. 2010). This linkage connects Point Lobos State Reserve along the coastline with Big Sur and Los Padres National Forest along the Santa Lucia Mountain Range. The project alignment occurs primarily within developed areas, which are a local barrier for wildlife movement; therefore, the project alignment is not considered to be a regional corridor for wildlife movement.

Impact Analysis

a. Would the project 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 Wildlife or U.S. Fish and Wildlife Service?

Special-Status Plants

As described above, three special-status plants have a low potential to occur adjacent to the project alignment due to the developed nature of the site and lack of suitable natural vegetation communities. Given the low potential to occur, it is not anticipated that the project would have a

substantial adverse effect, either directly or through habitat modifications, on special-status plans. Impacts to non-state or federally listed plant species would not be significant.

Special-Status Wildlife

Three special-status wildlife species have potential to occur within the project alignment based upon known ranges, habitat preferences, species occurrence records in the vicinity of the project site, and presence of suitable habitat. Impacts to western bumble bee and Crotch bumble bee foraging habitat due to development would not be significant given the size of the project alignment and low potential for these species to occur.

There is potential for California red-legged frog to occur in the southern staging area during upland movement during rain events or humid conditions and/or foraging at night. Impacts could include injury or mortality if individuals take refuge under equipment or construction materials and are crushed. In addition, food trash left by construction workers could attract predators to the site, and unexpected spills of fuel or other construction materials, if allowed to flow into the overflow ditch or riparian habitat, could pollute or degrade water quality. Given the small size of the southern staging area, impacts on a population level are not expected; however, impacts to individuals during construction may be significant. Since the California red-legged frog is federally listed as threatened, any project that cannot avoid take of individuals (e.g., harm or harass this species), must obtain incidental take authorization from USFWS under the FESA. This species is only expected to occur transiently. The project includes replacement of existing sewer mains within the right-of-way, and construction staging at two staging areas. No adverse impacts to suitable habitat or destruction of or modification to critical habitat for this species would occur, and "take" of individuals would be avoided through implementation of mitigation measures. Impacts to California red-legged frog could be significant; however, with implementation of spill/debris prevention measures as required by the SWPPP (see Section 10, *Hydrology and Water Quality*) and Mitigation Measures BIO-1 through BIO-3, impacts to special-status wildlife species would be reduced to less than significant.

Construction noise has the potential to result in potentially significant impacts to nesting birds in adjacent trees and vegetation as a result of nest abandonment and failure which can result in injury, harm, or mortality. However,, with implementation of Mitigation Measure NOI-1, construction noise would be reduced to below 85 dBA Leq, which is below levels anticipated to result in injury, harm, or mortality to nesting birds.

Mitigation Measures

Refer to Mitigation Measure NOI-1 in Section 13, *Noise*.

BIO-1 Worker Environmental Awareness Program (WEAP)

Prior to initiation of construction activities (including staging and mobilization), CAWD shall retain a qualified biologist to conduct a Worker Environmental Awareness Program (WEAP) training for all personnel associated with project construction to aid workers in recognizing special-status resources that may occur in the construction area. The specifics of this program shall include identification of the sensitive species and habitats, a description of the regulatory status and general ecological characteristics of sensitive resources, and review of the limits of construction and mitigation measures required to reduce impacts to biological resources within the work area, including western bumble bee, California red-legged frog, nesting birds, riparian and jurisdictional areas, and protected trees. A fact sheet conveying this information shall also be prepared for distribution to all contractors, their employees, and other personnel involved with construction. All

employees shall sign a form provided by the qualified biologist indicating they have attended the WEAP training and understand the information presented to them. The form shall be submitted to CAWD by the qualified biologist to document compliance.

BIO-2 California Red-legged Frog Avoidance and Minimization

Within 48 hours of initial mobilization activities, a qualified biologist shall conduct a survey for California red-legged frog at the southern staging area, located in the previously disturbed vacant lot north of the CAWD Wastewater Treatment Plant and south of the Carmel Mission Basilica Museum. The survey area shall include the proposed disturbance area, including areas disturbed for vehicle staging and materials storage, and all proposed ingress/egress routes, plus a 100-foot survey buffer. If any life stage of California red-legged frog is found within the survey area, the individual shall be avoided and allowed to leave the site of its own volition. The biologist shall revisit the site on subsequent days to confirm the California red-legged frog has left the site. If the California red-legged frog has not left the site after three days, the United States Fish and Wildlife Service (USFWS) shall be consulted to determine the appropriate course of action.

During construction, CAWD shall ensure that the following avoidance measures are implemented:

- All staging activities at the southern staging area adjacent to riparian habitats and the overflow ditch shall be completed between April 1 and October 31 to the extent feasible.
- If construction must occur between November 1 and March 31, the qualified biologist shall conduct a pre-activity clearance sweep within 48 hours prior to start of project activities after any rain events of 0.1 inch or greater or if wet conditions are present on-site.
- During project activities, all trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris shall be removed from work areas.
- If any life stage of the California red-legged frog is found and these individuals are likely to be killed or injured by work activities, all work activities that could pose a risk of take to the individual shall stop until the individual has left the site. No individuals shall be relocated without USFWS authorization.

BIO-3 Spill/Debris Prevention

CAWD shall ensure that during construction all refueling and maintenance of equipment and vehicles shall occur a minimum of 250 feet from the Carmel River, wetlands, willow thicket habitat, and in a location from which a spill would not drain directly toward these habitats (e.g., on a slope that drains away from the water), or in a containment structure. If refueling must occur within 250 feet, secondary containment (secondary containment is in addition to spill and drip pans and absorbent material, e.g., an earthen berm covered in visqueen) shall be required. Prior to the onset of work, a plan shall be developed by CAWD for prompt and effective response to any accidental spills. The construction foreman or directing engineer shall insure all workers are informed of the importance of preventing spills and of the appropriate measures to take in the event of a spill. Should any debris or equipment from the work area fall into the wetland, riparian habitat, and the concrete drainage, it shall be removed immediately by the contractor.

Significance After Mitigation

With implementation of Mitigation Measures BIO-1 through BIO-3, which require WEAP training, California red-legged frog avoidance, and spill and debris prevention, as well as with

implementation of Mitigation Measure NOI-1, which would limit construction noise, project related impacts to biological resources would be reduced to a less than significant level.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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

No project elements are proposed within the arroyo willow thickets, overflow ditch, wetland habitats, or federally designated California red-legged frog critical habitats. No development would occur within ESHAs. If spills occur during construction adjacent to the arroyo willow thicket at the southern staging area and fuel or other toxic material were allowed to flow into these areas, impacts to sensitive communities could occur, and may be considered significant. With implementation of spill/debris prevention measures as required by the SWPPP (see Section 10, *Hydrology and Water Quality*), Mitigation Measures BIO-1, BIO-3, and BIO-4 impacts to sensitive natural communities would be reduced to less than significant.

Mitigation Measures

Refer to Mitigation Measures BIO-1 and BIO-3, above.

BIO-4 Sensitive Natural Community Avoidance

Prior to initiation of construction at the southern staging area adjacent to the willow thicket, overflow ditch, or wetland habitats, CAWD shall ensure that environmentally sensitive area (ESA) fencing shall be installed around the outer limits of these areas under the direction of a qualified biologist, to prevent encroachment. CAWD shall ensure that no equipment, construction personnel, staging or other project activities shall be allowed within ESA areas. ESA fencing materials shall be high visibility and tall enough to create an effective barrier. ESA fencing shall remain in place until all construction activities are completed and the staging area has been de-mobilized.

Significance After Mitigation

Implementation of Mitigation Measures BIO-1, BIO-3, and BIO-4, which involve WEAP training, spill and debris prevention, and sensitive natural community avoidance, would reduce impacts to sensitive natural communities to a less than significant level.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

c. Would the project 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 project has been designed to avoid direct impacts to wetland features; however, direct or indirect impacts may occur if construction equipment, workers, debris, or spills inadvertently enter wetlands adjacent to the southern staging area including the overflow ditch and willow thicket. With the implementation of spill/debris prevention as required by the SWPPP (see Section 7, Geology and Soils), Mitigation Measures BIO-1 and BIO-4, impacts to wetlands would be reduced to less than significant with mitigation.

Mitigation Measures

Refer to Mitigation Measures BIO-1 and BIO-4, above.

Significance After Mitigation

Implementation of Mitigation Measures BIO-1 and BIO-4, which involve WEAP training and sensitive natural community avoidance, would reduce impacts to wetlands to a less than significant level.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

d. Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The project alignment is not located within any corridors for wildlife movement, and does not provide opportunities for local movement due to the project's location within existing development. There would be no impact to wildlife movement.

NO IMPACT

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The City of Carmel-by-the-Sea General Plan and Local Coastal LUP, the County's Carmel Area LUP, and City and County Municipal Codes include policies to protect the biological resources and open space such as the urban Monterey Cypress and Monterey Pine forest, coastal dunes and beaches, and the Carmel River. The proposed project would occur entirely within paved or bare areas and would avoid impacts to coastal habitats and the Carmel River. No trees are proposed for removal, and it is likely trees adjacent to construction where trenching may occur within the root zone could be protected. Trenching within the project alignment could potentially impact protected trees defined by the City's CRME and Municipal Code Chapter 17.48, if conducted within their Tree Protection Zones (TPZs). The CRME policies state that Monterey pine, Monterey Cypress, and coast live oak species should be preserved and requires a documented site assessment of trees on each proposed construction site, established tree protection zones and suitable locations for development, and to avoid encroaching on the root protection zone of significant trees.

Monterey County Municipal Code Chapter 16.60 – Preservation of Oak and Other Protected Trees states that removing, poisoning, cutting down or trimming more than one-third of the green foliage of any tree is not allowed without a permit.

With implementation of Mitigation Measures BIO-1, BIO-4, and BIO-5, impacts to protected biological resources would be reduced to less than significant with mitigation.

Mitigation Measures

Refer to Mitigation Measures BIO-1 and BIO-4, above.

BIO-5 Arborist Study

If open trenching or excavation occurs within the dripline of trees, CAWD shall ensure that prior to construction a tree survey shall be conducted to locate and identify all protected trees defined by the City's Coastal Resource Management Element (CRME) and Municipal Code and the County Municipal Code with any portion of their canopy dripline located within 20 feet of the project

alignment. During the survey, the following information shall be documented for each protected tree:

- Field locations of the trunk of all protected trees with any portion of their driplines within 20 feet of the project site, as feasible without trespassing on private lands
- Identification of each tree by both scientific and common names
- Diameter at breast height (DBH)
- Canopy height and spread in four cardinal directions
- Dripline canopy of each tree located within the project area
- Health assessment (dead, very poor, poor, fair, good, excellent)
- Structural defects (cracks, decay, broken limbs, etc.), if any
- Representative photographs
- Tree protection measures

The results of the survey shall be presented in an Arborist Report including recommendations for the protection of trees adjacent to the project alignment in accordance with the City's CRME and Municipal Code and the County CIP and Municipal Code standards and requirements. CAWD shall ensure recommendations contained in the Arborist Report are implemented during construction. Measures may include, but would not be limited to, tree protection standards, including measures to be implemented prior to construction, during construction, and after construction. If project component activities would result in impacts to the roots of protected trees, CAWD shall ensure that all trimming occurs under the direction of a certified arborist. Tree protection measures may include, but are not limited to, the following: inspection of roots and overall tree health prior to pruning, exposure of roots using minimally damaging excavation methods, selective pruning with appropriately disinfected tools, protection of newly exposed roots from desiccation and pests, and mulching, watering, and post construction inspections and adaptive management to ensure the continued health of the tree.

Significance After Mitigation

Implementation of Mitigation Measures BIO-1, BIO-4, and BIO-5, which involve WEAP training, sensitive natural community avoidance, and an arborist study, would reduce impacts to protected biological resources to a less than significant level.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

f. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The project alignment is not within the boundaries of an adopted habitat conservation plan or natural community conservation plan or other approved local, regional, or state habitat conservation plan (CDFW 2019). Therefore, the proposed project would not conflict with adopted habitat conservation plans or natural community conservation plans or other approved local, regional, or state habitat conservation plans. There would be no impact.

NO IMPACT

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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 §15064.5?	☐	■	☐	☐
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	■	☐	☐
c. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	■	☐

This section provides an analysis of the project's impacts on cultural resources, including historical and archaeological resources as well as human remains. CEQA requires a lead agency to determine whether a project may have a significant effect on historical resources (Public Resources Code [PRC] Section 21084.1). A historical resource is a resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources (CRHR); a resource included in a local register of historical resources; or any object, building, structure, site, area, place, record, or manuscript a lead agency determines to be historically significant (CEQA Guidelines Section 15064.5[a][1-3]).

A resource shall be considered historically significant if it:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

In addition, if it can be demonstrated that a project would cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that resources cannot be left undisturbed, mitigation measures are required (PRC Section 21083.2[a-b]). PRC Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it:

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

The impact analysis included here is organized based on the cultural resources thresholds included in CEQA Guidelines Appendix G: Environmental Checklist Form. Threshold A broadly refers to historical resources. To more clearly differentiate between archaeological and built environment resources, the analysis under item (a) is limited to built environment resources. Archaeological resources and traditional places, including those that may be considered historical resources pursuant to Section 15064.5 and those that may be considered unique archaeological resources pursuant to Section 21083.2, are considered under item (b).

Methodology and Results of Cultural Resources Assessment

In September 2023, Rincon conducted a cultural resources investigation and analysis of the project alignment. This analysis included a cultural resources records search of the California Historical Resources Information System (CHRIS) at the Northwest Information Center (NWIC), located at California State University, Sonoma, a Native American Heritage Commission (NAHC) Sacred Lands File (SLF) search, as well as background and archival research including a review of historical topographic maps, historical aerial imagery geologic maps, soils maps, and the geotechnical report prepared for the project. The results of the analysis are presented in the Cultural Resources Assessment (Rincon 2023).

The CHRIS records search was performed to identify previously conducted cultural resources studies, as well as previously recorded cultural resources within the project site and a 0.5-mile radius surrounding it. The records search included a review of available records at the NWIC, as well as the National Register of Historic Places (NRHP), the CRHR, the California Historical Landmarks list, and the Built Environment Resources Directory, as well as its predecessor the California State Historic Property Data File. Additionally, Rincon reviewed the Archaeological Determination of Eligibility list. The CHRIS records search identified 157 cultural resources studies that have been previously conducted within the 0.5-mile records search radius. Approximately 95 percent of the project area was evaluated as part of 13 cultural resources studies.

The CHRIS records search identified 11 previously recorded cultural resources within or immediately adjacent to (within 150 feet of) the project alignment. These 11 resources include three archaeological resources, five built environment resources, two multicomponent resources containing both archaeological and built environment components, and one traditional place (Rincon 2023).

Rincon contacted the NAHC on April 21, 2023, to request a search of the SLF. The NAHC responded on May 18, 2023, stating that the results of the SLF search were positive. The NAHC provided a list of 14 Native American contacts who may have knowledge of cultural resources of Native American origin within the area of potential effects. Potential project impacts to tribal cultural resources are discussed in Section 18, *Tribal Cultural Resources.*

a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

The NWIC records search identified five built environment resources and two multicomponent resources with built environment components immediately adjacent to the project alignment, including five single-family residences and structures associated with the Carmel Mission and Mission Ranch. None of these resources overlap with any project components, and the project would not directly alter, destroy, or otherwise impact these resources (Rincon 2023).

Manhole rehabilitation activities would occur near structures associated with Mission Ranch hotel and restaurant. As discussed further in Section 13, *Noise,* this project component would result in groundborne vibration that would exceed levels that could cause structural damage, potentially resulting in significant impacts. As such Mitigation Measure NOI-2 presented in Section 13, *Noise*, would be required to limit the use of construction equipment within 21 feet of structures on the Mission Ranch property to small equipment that does not exceed 100 horsepower. Other built environment resources along the project alignment, including the Carmel Mission, were determined to be unaffected by groundborne vibration based on the distance of the alignment from the Mission buildings. Implementation of Mitigation Measure NOI-2 would reduce groundborne vibration levels in the immediate vicinity of the Mission Ranch structures to below levels that could cause structural damage. Therefore, the project would not cause a substantial adverse change in the significance of a historical resource, and impacts would be less than significant with implementation of Mitigation Measure NOI-2. .

Mitigation Measures

Refer to Mitigation Measure NOI-2 in Section 13, *Noise*.

Significance After Mitigation

As discussed in Section 13, *Noise*, Mitigation Measure NOI-2 limits the use of construction equipment within 21 feet of structures on the Mission Ranch property to small equipment that does not exceed 100 horsepower. Implementation of Mitigation Measure NOI-2 would reduce groundborne vibration levels at Mission Ranch structures to below levels that could cause structural damage. Therefore, project related impacts to historic resources would be reduced to a less than significant level with mitigation incorporated.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

b. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

The NWIC records search identified three archaeological resources and two multicomponent resources with archaeological components within or adjacent to the project alignment, one of which is within 60 feet of project components and four of which directly overlap with project components (Rincon 2023). Project construction would involve ground disturbing activities, including open cut trenching, lateral replacement, and manhole rehabilitation adjacent to or within the mapped boundaries of these resources. The background and archival research indicates that these resources have been previously disturbed as a result of the existing pipeline's installation and maintenance, as indicated by the presence of fill material along the existing pipeline alignment within the mapped areas of these resources. Because the project would replace sewer mains within their existing locations, the project would not result in additional disturbance to these previously-disturbed resources, and accordingly, the project would not alter the existing level of integrity of these resources and would not otherwise affect their eligibility for listing in the CRHR (Rincon 2023). Nonetheless, project-related ground disturbance could unintentionally intrude into or damage previously undisturbed elements of these resources, which could result in a substantial adverse change in their significance, a potentially significant impact. Therefore, Mitigation Measures CUL-1 through CUL-3 would be required to reduce project impacts to archaeological resources to a less than significant level.

Additionally, a traditional place resource is located proximate to the project's southern-most staging area. No project related ground disturbance would occur in the immediate vicinity of the resource, nor would the project introduce any above ground elements near or within the traditional place. Therefore, no impacts would occur to this resource as a result of project implementation.

Mitigation Measures

CUL-1 Retention of a Qualified Archaeologist

Prior to the start of project-related ground disturbing activity, CAWD shall retain a Qualified Archaeologist, defined as an archaeologist meeting the Secretary of the Interior's Standards for professional archaeology, to carry out all mitigation measures related to cultural resources.

CUL-2 Pre-Construction Cultural Resources Sensitivity Training

Prior to the start of project-related ground disturbing activities, a cultural resources specialist working under the supervision of the Qualified Archaeologist shall conduct cultural resources sensitivity training for all construction personnel. Construction personnel shall be informed of the types of archaeological resources that may be encountered, and of the proper procedures to be enacted in the event of an inadvertent discovery of archaeological resources or human remains. CAWD shall ensure that construction personnel attend the training and retain documentation demonstrating attendance.

CUL-3 Development and Implementation of Cultural Resources Monitoring Plan

Prior to the start of project-related ground disturbing activities, the Qualified Archaeologist, or a cultural resources specialist under the supervision of the Qualified Archaeologist, shall prepare a Cultural Resources Monitoring Plan (CRMP). The CRMP shall stipulate that all project-related ground disturbance within a 250-foot radius around archaeological resources P-27-000152, -000153, -000154, -001323, and -002482 be subject to archaeological and Native American monitoring, and that all initial ground disturbance outside the 250-foot resource buffers be subject to archaeological and Native American monitoring. Archaeological and Native American monitoring within the 250-foot buffer around the archaeological resources shall not be reduced. However, the CRMP shall contain an allowance that the Qualified Archaeologist may reduce or discontinue monitoring outside the 250-foot resource buffers as warranted if it is determined that the possibility of encountering intact archaeological deposits in these areas is low, based on observations of subsurface soil stratigraphy or other factors during initial ground disturbance and in coordination with the Native American monitor(s) and CAWD. The reduction or elimination of Native American monitoring outside the 250-buffer shall be undertaken based on the stipulations outlined in Mitigation Measure TCR-1. The CRMP shall include figures depicting the pipeline segments wherein monitoring may be reduced and the segments wherein monitoring may not be reduced. The GIS data used to develop these figures may be used by CAWD and their contractor to incorporate into the project engineering plans.

The CRMP shall include monitoring protocols to be carried out during project construction. The CRMP shall stipulate that, as outlined in Mitigation Measure TCR-1, CAWD retain a Native American monitor associated with one or more of the Native American groups that have expressed interest in the project to monitor all project-related ground disturbance stipulated in the CRMP. In preparing the CRMP, CAWD shall consult with the Native American groups that have expressed interest in

monitoring to determine the scheduling of monitors. A Native American monitoring schedule shall be incorporated into the CRMP.

The CRMP shall outline the appropriate measures to be followed in the event of discovery of cultural resources during project construction, including that all ground disturbance within 100 feet of a discovery shall cease until a treatment plan is developed by the Qualified Archaeologist in coordination with CAWD and the Native American monitor(s) that considers the resources' archaeological and tribal value. The CRMP shall specify the measures to be incorporated into a treatment plan, as outlined in Mitigation Measure TCR-2, in the event an inadvertent discovery qualifies as a tribal cultural resource. The CRMP shall identify avoidance as the preferred manner of mitigating impacts to cultural resources. The CRMP shall establish the criteria utilized to evaluate the significance (per CEQA) of the discoveries, methods of avoidance consistent with CEQA Guidelines Section 15126.4(b)(3).

In the event that preservation in place of the unanticipated discovery is demonstrated to be infeasible and data recovery through excavation is the only feasible mitigation available, the CRMP shall outline the preparation of an Archaeological Resources Treatment Plan (ARTP) by the Qualified Archaeologist in consultation with CAWD that provides for the adequate recovery of the scientifically consequential information contained in the archaeological resource. The CRMP shall stipulate the ARTP will include: relevant local and regional research questions to be addressed by the data recovery; provisions for Native American monitoring; field, laboratory, and special studies methodologies; and a plan for the final disposition of the cultural materials collected. The CRMP shall stipulate the Qualified Archaeologist and CAWD shall consult with appropriate Native American representatives regarding the ARTP in determining treatment for prehistoric or Native American resources to ensure cultural values ascribed to the resource, beyond those that are scientifically important, are considered.

The CRMP shall also outline the appropriate procedures to be undertaken in the event human remains are encountered. Specifically, the CRMP shall stipulate that in the case human remains are uncovered during project construction, all work within 100 feet of the find shall be immediately halted, and the protocols set forth in Section 15064.5(e)(1) of the CEQA Guidelines, Health and Safety Code Section 7050.5(c), and Public Resources Code Section 5097.98 (as amended by AB 2641) be implemented. These protocols include contacting the Monterey County coroner to evaluate the remains. If the County Coroner determines that the remains are Native American, the County Coroner shall contact the NAHC. The NAHC shall then identify a Most Likely Descendant (MLD) of the deceased Native American, who shall then help determine what course of action should be taken in the disposition of the remains.

Prior to the start of project construction, the CRMP shall be submitted to CAWD for review and approval, as well as to the Native American groups that have expressed interest in the project for review and comment before being finalized. The requirements outlined in the final CRMP shall be implemented during project construction.

Significance After Mitigation

With implementation of Mitigation Measures CUL-1 through CUL-3, which involve the retention of a qualified archaeologist, archaeological resources sensitivity training, and preparation and implementation of a CRMP during construction, project related impacts to archaeological resources would be reduced to a less than significant level.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

c. Would the project disturb any human remains, including those interred outside of formal cemeteries?

The discovery of human remains is always a possibility during ground disturbing activities, which would be required for the proposed project. In addition to being potential archaeological resources, human burials have specific provisions for treatment in PRC Section 5097. Additionally, California Health and Safety Code Sections 7050.5, 7051, and 7054 contain specific provisions for the protection of human burial remains. Existing regulations address the illegality of interfering with human burial remains and protects them from disturbance, vandalism, or destruction. PRC Section 5097.98 also addresses the disposition of Native American burials, protects such remains and establishes the NAHC as the entity to resolve any related disputes.

If human remains are found, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to PRC Section 5097.98. In the event of an unanticipated discovery of human remains, the County coroner must be notified immediately. If the human remains are determined to be prehistoric, the coroner will notify the NAHC, which will determine and notify a most likely descendant (MLD). The MLD shall complete the inspection of the site within 48 hours of being granted access to the site and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials. Due to required compliance with PRC Section 5097.98 and California Health and Safety Code Section 7050.5, impacts to human remains would be less than significant.

LESS THAN SIGNIFICANT IMPACT

6 Energy

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

As a state, California is one of the lowest per capita energy users in the United States, ranked 49th in the nation, due to its energy efficiency programs and mild climate (United States Energy Information Administration 2022). Electricity and natural gas are primarily consumed by the built environment for lighting, appliances, heating and cooling systems, fireplaces, and other uses such as industrial processes in addition to being consumed by alternative fuel vehicles. The project would not result in a net increase in electricity usage in the CAWD service area as compared to existing conditions and would not include natural gas connections. Therefore, electricity and natural gas consumption are not discussed further in this analysis.

Petroleum fuels are primarily consumed by on-road and off-road equipment in addition to some industrial processes, with California being one of the top petroleum-producing states in the nation (CEC 2022a). Gasoline, which is used by light-duty cars, pickup trucks, and sport utility vehicles, is the most used transportation fuel in California with 13.8 billion gallons sold in 2021 (CEC 2022b). Diesel, which is used primarily by heavy duty-trucks, delivery vehicles, buses, trains, ships, boats and barges, farm equipment, and heavy-duty construction and military vehicles, is the second most used fuel in California with 1.9 billion gallons sold in 2021 (CEC 2022b).

Energy consumption is directly related to environmental quality in that the consumption of nonrenewable energy resources releases criteria air pollutant and greenhouse gas (GHG) emissions into the atmosphere. The environmental impacts of air pollutant and GHG emissions associated with the project's energy consumption are discussed in detail in Section 3, *Air Quality*, and Section 8, *Greenhouse Gas Emissions*, respectively.

a. Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Construction

The project would require site preparation, including hauling material off-site, pipeline installation, and pavement and site restoration. During project construction, energy would be consumed in the

form of petroleum-based fuels used to power construction vehicles and equipment on the project site, construction worker travel to and from the project site, and vehicles used to transport materials to and from the site. As shown in Table 8, project construction would require approximately 4,875 gallons of gasoline and approximately 44,536 gallons of diesel fuel. These construction energy estimates are conservative because they assume that the construction equipment used in each phase of construction is operating every day of construction.

Table 8 Estimated Fuel Consumption during Construction

	Fuel Consumption (gallons)	
Source	**Gasoline**	**Diesel**
Construction Equipment & Vendor/Hauling Trips	--	44,536
Construction Worker Vehicle Trips	4,875	--

See Appendix C for energy calculation sheets.

Energy use during construction would be temporary and construction equipment used would be typical of similar-sized construction projects in the region. In addition, construction contractors would be required to comply with the provisions of California Code of Regulations Title 13 Sections 2449 and 2485, which prohibit diesel-fueled commercial motor vehicles and off-road diesel vehicles from idling for more than five minutes and would minimize unnecessary fuel consumption. Construction equipment would be subject to the USEPA Construction Equipment Fuel Efficiency Standard, which would also minimize inefficient, wasteful, or unnecessary fuel consumption. These practices would result in efficient use of energy necessary to construct the project. In the interest of cost-efficiency, construction contractors also would not utilize fuel in a manner that is wasteful or unnecessary. Therefore, the project would not involve the inefficient, wasteful, and unnecessary use of energy during construction, and impacts would be less than significant.

Operation

The project would not result in additional vehicle fuel demands, as the maintenance needs of the new pipeline would be reduced compared to existing conditions due to its improved condition after replacement. As such, the project would result in beneficial impacts related to vehicle fuel demands. The project would also not introduce new electricity demands, and would be consistent with similar pipeline facilities and equipment used throughout California. Furthermore, the project would not introduce new staffing needs. Therefore, the project would not result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources during construction or operation. No adverse energy impact would occur during operation.

LESS THAN SIGNIFICANT IMPACT

b. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

CAWD has not adopted a plan for renewable energy or energy efficiency with which the project could comply. Goal O7-5 and Policy P7-18 of the Carmel-by-the-Sea General Plan Open Space and Conservation Element are directed at promoting energy efficiency, and Goal OS-9 of the Monterey County General Plan (2010) and its related policies are directed at promoting efficient energy usage. The Association of Monterey Bay Area Governments' 2045 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) does not contain policies related to construction

emissions, and the project would not include any sources of operational emissions. Therefore, the project would not conflict with the 2045 MTP/SCS and its policies. As detailed under item (a), the project would not introduce new electricity needs to the existing wastewater system and would result in fewer operations and maintenance trips, which would further Goal OS-9 and its policies. Senate Bill (SB) 100 mandates 100 percent clean electricity for California by 2045. The proposed project would not consume electricity. However, the existing 8th and Scenic wastewater lift station is powered by the electricity grid and would eventually be powered by renewable energy mandated by SB 100. The project would not conflict with this statewide plan. Additionally, the project area is served by Central Coast Community Energy (3CE), which offers electricity supplied by approximately 31 percent renewable energy in its 3CE Choice program and electricity supplied by 100 percent renewable energy in its 3CE Prime program (3CE 2022). 3CE is subject to the requirements of SB 100 and aims to provide 100 percent clean electricity to all customers by 2030, which would be 15 years ahead of the State's goal. As such, the proposed project would receive electricity that meets or exceeds State requirements for renewable energy generation (3CE 2022). Therefore, the project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency, and no impact would occur.

NO IMPACT

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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:				
1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?	☐	☐	■	☐
2. Strong seismic ground shaking?	☐	☐	■	☐
3. Seismic-related ground failure, including liquefaction?	☐	☐	■	☐
4. Landslides?	☐	☐	■	☐
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	■	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	■	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	■	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	■
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	■	☐

The following discussion is partially based on the Geotechnical Investigation prepared for the project by Pacific Crest Engineering, Inc. in June 2022. The Geotechnical Investigation is included as Appendix D.

a.1. Would the project 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?

a.2. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

The San Andreas Fault system, which is the most active fault system in California, runs approximately 45 miles east of the project alignment (DOC 2023b). Two other active faults, the Palo Colorado-San Gregorio Fault zone and the Monterey Bay-Tularcitos Fault zone, also occur Monterey County and are approximately 0.5 mile from the project alignment (County of Monterey 2023). Earthquakes are classified by magnitude; magnitudes up to 5.9 may be felt but cause only minor damage (USGS 2023). Research by the USGS reported that the San Andreas Fault has a 22 percent probability of a magnitude 6.7 or greater earthquake by 2043, which would have the potential to cause structural damage (USGS 2016).

The project alignment could be subject to seismic ground shaking during an earthquake of this magnitude from the San Andreas Fault, or any other active fault in the region. The proposed project would involve the replacement of an existing pipeline along the project alignment. A large seismic event, such as a fault rupture, seismic shaking, or ground failure, could result in breakage of the proposed pipeline, failure of joints, and/or underground leakage from the pipes. This risk already exists with the current pipelines in place along the project alignment. In the event an earthquake compromised any project component during operation, CAWD would temporarily shut off the water supply and conduct emergency repairs as soon as possible. Additionally, project design would comply with materials and installation standards of the American Water Works Association as required pursuant to 22 California Code of Regulations (CCR) Chapter 16, which would minimize risk of structural failure in a seismic event and would reduce any potential secondary impacts. Therefore, the project would not expose people or structures to potential substantial adverse effects involving strong seismic ground shaking. Furthermore, because an existing pipeline is already in use along the project alignment, the proposed project would not increase exposure of people or structures to seismic hazards, but rather would reduce risks by replacing an aging pipeline with a new one. Therefore, impacts related to fault rupture and seismic ground shaking would be less than significant.

LESS THAN SIGNIFICANT IMPACT

a.3. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

According to Monterey County hazard maps, most of the project alignment is not within a mapped liquefaction hazard zone. A portion of the project alignment along Carmelo Street south of 16th Avenue is within an area mapped for moderate to high liquefaction potential (Appendix D). However, the project would not involve any activities (such as fracking or mining) that could trigger an earthquake that would in turn lead to damage from liquefaction. Therefore, the project would not directly or indirectly cause potential adverse effects related to seismic ground failure or

liquefaction. Impacts related to seismic ground failure and liquefaction would be less than significant.

LESS THAN SIGNIFICANT IMPACT

a.4. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

The project alignment is not located in an earthquake-induced landslide hazard zone and is relatively flat (DOC 2023c). Portions of the project alignment along Scenic Road are located adjacent to coastal bluffs that would be subject to erosion and instability; however, the Geotechnical Investigation concludes that the proposed method of pipe bursting would not be likely to increase existing risks associated with bluff instability (Appendix D). Therefore, landslides are not expected within the project alignment. In addition, the project does not include habitable structures. While the project alignment is located adjacent to development, including single family residential uses, the Carmel River Elementary School, the Mission Ranch hotel and restaurant, and the Carmel Mission, it would not alter existing structures and would therefore not expose people to loss, injury, or death involving landslides. Additionally, project implementation would not exacerbate the existing risk of earthquake-induced landslides in the immediate vicinity of the alignment because the project would not directly result in a seismic event or destabilize soils prone to landslide. In the event an earthquake compromised any segment of the alignment due to landslides during operation, CAWD would temporarily shut off the system and conduct emergency repairs. Therefore, because the project alignment is not located in an earthquake-induced landslide hazard zone and the project would not introduce new infrastructure to the alignment that would exacerbate landslide hazards, the proposed project would not directly or indirectly cause potential adverse effects involving earthquake-induced landslides. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project result in substantial soil erosion or the loss of topsoil?

Soil erosion or the loss of topsoil may occur when soils are disturbed but not secured or restored, such that wind or rain events may mobilize disturbed soils, resulting in their transport off the project alignment. Construction of a majority of the pipeline would be installed under existing pervious roadways that would be restored to existing conditions upon completion of construction. All open trench excavation would be within roadway right-of-way and within soils that were previously disturbed during installation of the existing pipeline. At the southeastern most portion of the alignment, east of Carmel River Elementary School, the pipeline would be installed in an undeveloped, vegetated area. Although the pipeline would be installed via pipe bursting in this area, there is still limited potential for soil disturbance due to construction activities. The Geotechnical Investigation determined that surface soils along the project alignment have moderate potential for erosion (Appendix D).

Project construction would include dust control via use of a water truck, watering the construction area daily or as needed. When located within the jurisdiction of the City, the project would be required to comply with Carmel-by-the-Sea Municipal Code Chapter 17.43, *Water Quality Protection Ordinance,* which would require City review of project site design and erosion source control and could require implementation of best management practices (BMPs) to reduce erosion. Additionally, when located within the jurisdiction of Monterey County, the project would be required to comply with Monterey County Code (MCC) Chapter 16.12, *Erosion Control*, which would require the project to prepare an Erosion Control Plan and minimize runoff from the project

alignment. Chapter 16.12 requires that land clearing be kept to a minimum, that mulching and watering be utilized to establish new vegetation, and that additional protective measures are utilized if land clearing occurs during the winter season. In addition, because project disturbance would total more than one acre, construction would require a NPDES Construction General Permit and the submittal a Stormwater Pollution Prevention Plan (SWPPP) pursuant to MCC Chapter 16.14, *Urban Stormwater Quality Management and Discharge Control*. The SWPPP is intended to minimize the amount of sediment and other pollutants associated with construction sites which are discharged in stormwater runoff. The SWPPP would include Best Management Practices (BMPs) for erosion control, such as preventing runoff from unprotected slopes, keeping disturbed areas to a minimum, and installing check berms and desilting basins during construction activities, as necessary. BMPs required by the SWPPP would be included in the design of the project and are not mitigation measures. With adherence to existing regulations in the Carmel-by-the-Sea Municipal Code and MCC, potential adverse impacts associated with erosion and loss of topsoil would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project 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?

Although the proposed project would be located in a seismically active area, the project is not located in an earthquake-induced landslide hazard zone (CGS 2023). As discussed above under item (a.3), most of the project alignment is not within a liquefaction hazard zone, except for a small portion of the project alignment along Carmelo Street south of 16th Avenue (Appendix D). Project implementation would occur in a relatively flat area that is already utilized for underground wastewater transmission. In addition, in accordance with MCC Section 16.08.110, *Permit—Geotechnical and Engineering Geology Reports*, CAWD has prepared a geotechnical investigation (Appendix D) including conclusions and recommendations for design criteria and construction of the project given the geologic conditions along the project alignment, to inform project design and permit requirements. CAWD would comply with the recommendations made therein. Therefore, because the project would implement recommendations in Geotechnical Investigation, the proposed project is not anticipated to significantly affect soil stability or increase the potential for local or regional landslides or liquefaction. This impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project 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?

The geotechnical investigation determined subsurface conditions along the project alignment include sand with gravel, silty sand, and clay, and soils throughout the project alignment vary from low to highly expansive clay soils (Appendix D). Due to the clay content of the soils, there is potential for expansive soils to occur on-site. However, as discussed under item (c) above, the Geotechnical Investigation will inform project design and permit requirements prior to the start of project construction. The Geotechnical Investigation contains considerations to minimize potential impacts for expansive soils, including replacing the upper two feet of excavated native soils, which are expansive soils in some areas, with imported, non-expansive fill soil. Implementation of this recommendation would minimize potential expansive soils impacts to the replaced sewer lines. Additionally, as described under *Project Description*, the pipe would be replaced via pipe bursting,

which would minimize soil disturbance and excavation. As discussed under items (a.1) and (a.2), the proposed project would also be designed and constructed to meet CCR requirements for materials and installation. In addition, the proposed project would not add structures and would not alter any existing structures near the project alignment. There would be no visitors or permanent on-site employees associated with project operation. Therefore, the proposed project would not expose people to risks related to expansive soils. As a result, the project would not create substantial direct or indirect risks to life or property as a result of expansive soil, and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

e. Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

The project involves replacement of existing sewer mains and does not include septic tanks or alternative wastewater disposal systems. There would be no impact.

NO IMPACT

f. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Paleontological resources, or fossils, are the evidence of once-living organisms preserved in the rock record. They include both the fossilized remains of ancient plants and animals and the traces thereof (e.g., trackways, imprints, burrows). Paleontological resources are not found in "soil" but are contained within the geologic deposits or bedrock that underlies the soil layer. Typically, fossils are greater than 5,000 years old (i.e., older than middle Holocene in age) and are typically preserved in sedimentary rocks. Although rare, fossils can also be preserved in volcanic rocks and low-grade metamorphic rocks under certain conditions (Society of Vertebrate Paleontology [SVP] 2010). Fossils occur in a non-continuous and often unpredictable distribution within some sedimentary units, and the potential for fossils to occur within sedimentary units depends on several factors. It is possible to evaluate the potential for geologic units to contain scientifically important paleontological resources, and therefore evaluate the potential for impacts to those resources and provide mitigation for paleontological resources if they are discovered during construction of a development project.

The paleontological sensitivity of the geologic units underlying the project alignment was evaluated based on a desktop review of existing data, including geologic maps, published literature, and online fossil locality and collections databases. The potential for impacts to significant paleontological resources is based on the potential for ground disturbance to directly impact paleontologically sensitive geologic units. The SVP has developed a system for assessing paleontological sensitivity and describes sedimentary rock units as having high, low, undetermined, or no potential for containing significant nonrenewable paleontological resources (SVP 2010). This criterion is based on rock units within which vertebrate or significant invertebrate fossils have been determined by previous studies to be present or likely to be present.

The project alignment is situated on the Monterey Peninsula in the Coast Ranges geomorphic province (California Geological Survey 2002). The surface geology of the project alignment is mapped as Lighthouse coastal terrace deposits and undivided coastal terrace deposits (Clark 1997). Lighthouse coastal terrace deposits and undivided coastal terrace deposits consist of semi-

consolidated, moderately to well-sorted marine sand containing thin, discontinuous gravel-rich layers and are Pleistocene in age. Pleistocene-aged coastal terrace sediments have produced many scientifically significant fossils throughout California, including Monterey County. A review of the museum records maintained in the University of California Museum of Paleontology (UCMP) online collections database identify multiple significant fossil localities in Monterey County yielding taxa such as ground sloth (*Paramylodon*), horse (*Equus*), bison (*Bison*), and invertebrates (UCMP 2023). Therefore, in accordance with SVP guidelines, Quaternary old (Pleistocene) Lighthouse Coastal Terrace Deposits and Miocene Unnamed Sandstone mapped within the project alignment are assigned a high paleontological sensitivity (SVP 2010).

Project ground disturbance (i.e., open trenching) would reach a maximum depth of approximately 15 feet below ground surface. However, this trenching would only impact previously disturbed sediments because the new sewer mains would be installed in the same alignment as the existing sewer. Previously disturbed sediments lack important geologic and other scientific data associated with potential fossil resources, and therefore, are not paleontologically sensitive. Project related impacts to paleontological resources are anticipated to be less than significant.

LESS THAN SIGNIFICANT IMPACT

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

Overview of Climate Change and Greenhouse Gas Emissions

Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period. Climate change is the result of numerous, cumulative sources of greenhouse gas (GHG) emissions contributing to the "greenhouse effect," a natural occurrence which takes place in Earth's atmosphere and helps regulate the temperature of the planet. Most radiation from the sun hits Earth's surface and warms it. The surface, in turn, radiates heat back towards the atmosphere in the form of infrared radiation. Gases and clouds in the atmosphere trap and prevent some of this heat from escaping into space and re-radiate it in all directions.

GHG emissions occur both naturally and as a result of human activities, such as fossil fuel burning, decomposition of landfill wastes, raising livestock, deforestation, and some agricultural practices. GHGs produced by human activities include carbon dioxide (CO_2), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Different types of GHGs have varying global warming potentials (GWP). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emitted, referred to as "carbon dioxide equivalent" (CO_2e), which is the amount of GHG emitted multiplied by its GWP. Carbon dioxide has a 100-year GWP of one. By contrast, methane has a GWP of 30, meaning its global warming effect is 30 times greater than CO_2 on a molecule per molecule basis (Intergovernmental Panel on Climate Change [IPCC] 2021).[5]

The United Nations IPCC expressed that the rise and continued growth of atmospheric CO_2 concentrations is unequivocally due to human activities in the IPCC's Sixth Assessment Report (2021). Human influence has warmed the atmosphere, ocean, and land, which has led the climate to warm at an unprecedented rate in the last 2,000 years. It is estimated that between the period of 1850 through 2019, a total of 2,390 gigatonnes of anthropogenic CO_2 was emitted worldwide. It is likely that anthropogenic activities have increased the global surface temperature by approximately

[5] The Intergovernmental Panel on Climate Change's (2021) Sixth Assessment Report determined that methane has a GWP of 30. However, the 2017 Climate Change Scoping Plan published by the California Air Resources Board uses a GWP of 25 for methane, consistent with the Intergovernmental Panel on Climate Change's (2007) Fourth Assessment Report. Therefore, this analysis utilizes a GWP of 25.

1.07 degrees Celsius between the years 2010 through 2019 (IPCC 2021). Furthermore, since the late 1700s, estimated concentrations of CO_2, methane, and nitrous oxide in the atmosphere have increased by over 43 percent, 156 percent, and 17 percent, respectively, primarily due to human activity (USEPA 2023b). Emissions resulting from human activities are thereby contributing to an average increase in Earth's temperature. Potential climate change impacts in California may include loss of snowpack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (State of California 2018).

Regulatory Framework

In response to climate change, California implemented Assembly Bill (AB) 32, the "California Global Warming Solutions Act of 2006." AB 32 required the reduction of statewide GHG emissions to 1990 emissions levels (essentially a 15 percent reduction below 2005 emission levels) by 2020 and the adoption of rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions. On September 8, 2016, the Governor signed Senate Bill 32 into law, extending AB 32 by requiring the State to further reduce GHG emissions to 40 percent below 1990 levels by 2030.

AB 1279, the California Climate Crisis Act, was passed on September 16, 2022, and declares the State would achieve net zero GHG emissions as soon as possible, but no later than 2045, and to achieve and maintain net negative GHG emissions thereafter. In addition, the bill states that the State would reduce GHG emissions by 85 percent below 1990 levels no later than 2045.

In response to the passage of AB 1279 and the identification of the 2045 GHG reduction target, CARB published the Final 2022 Climate Change Scoping Plan in November 2022 (CARB 2022b). The 2022 Update builds upon the framework established by the 2008 Climate Change Scoping Plan and previous updates while identifying new, technologically feasible, cost-effective, and equity-focused path to achieve California's climate target. The 2022 Update includes policies to achieve a significant reduction in fossil fuel combustion, further reductions in short-lived climate pollutants, support for sustainable development, increased action on natural and working lands (NWL) to reduce emissions and sequester carbon, and the capture and storage of carbon.

The 2022 Update assesses the progress California is making toward reducing its GHG emissions by at least 40 percent below 1990 levels by 2030, as called for in SB 32 and laid out in the 2017 Scoping Plan. The 2022 Update also addresses recent legislation and direction from California Governor Gavin Newsom, extends and expands upon these earlier plans, and implements a target of reducing anthropogenic emissions to 85 percent below 1990 levels by 2045, taking an additional step of adding carbon neutrality as a science-based guide for California's climate work. The 2022 Update approaches decarbonization from two perspectives, managing a phasedown of existing energy sources and technologies, as well as increasing, developing, and deploying alternative clean energy sources and technology.

Significance Thresholds

The State of California, MBARD, County of Monterey, City of Carmel-by-the-Sea, and CAWD have not adopted GHG emissions thresholds. Therefore, this analysis utilizes the thresholds published by the Bay Area Air Quality Management District (BAAQMD), which is the air district immediately north of and adjacent to the jurisdiction of MBARD. The use of GHG thresholds developed by the adjoining BAAQMD is considered appropriate by CAWD because of the broad similarities between the two adjacent air basins. The NCCAB comprises the counties of Santa Cruz, Monterey, and San Benito, with a substantial portion of the air basin located within Santa Cruz and Monterey counties. The San

Francisco Bay Area Air Basin that is managed by BAAQMD consists of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties. The areas managed by the two air districts - BAAQMD and MBARD - contain a mix of urban and rural areas and similar emission sources, such as construction, electricity and natural gas consumption, agriculture, and transportation. Given the similarities between the two regions, CAWD has determined that the thresholds set forth by the BAAQMD are appropriate to use for the project.

To determine if a project's GHG emissions are significant under CEQA, BAAQMD recommends completing a "fair share" analysis to determine how a new development project should be "designed and built to ensure it will be consistent with the goal of carbon neutrality by 2045" (BAAQMD 2022). BAAQMD has only recommended thresholds for evaluating a project's operational emissions because "GHG emissions from construction represent a very small portion of a project's lifetime GHG emissions" (BAAQMD 2022). For a project's GHG emissions to be determined less than significant, a project must be consistent with a local GHG reduction strategy that meets the criteria of CEQA Guidelines Section 15183.5(b) or incorporate the following project design elements (BAAQMD 2022):

- Not include natural gas appliances or natural gas plumbing;
- Not result in wasteful, inefficient, or unnecessary energy usage as determined by the analysis required under PRC Section 21100(b)(3) and CEQA Guidelines Section 15126.2(b);
- Achieve a reduction in project-generated vehicle miles traveled (VMT) below the regional average consistent with the current version of the Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted SB 743 VMT target reflecting the recommendations provided in the Governor's Office of Planning and Research's *Technical Advisory on Evaluating Transportation Impacts in CEQA* (2018); and
- Achieve compliance with off-street electric vehicle requirements in the most recently adopted version of California Green Building Standards Code (CALGreen) Tier 2.

Methodology

For informational purposes, GHG emissions associated with project construction and operation were estimated using CalEEMod, version 2022.1.1.17, with the assumptions described under Section 3, *Air Quality*. For the purposes of this GHG analysis, it was assumed the project would have a 50-year lifetime. Construction emissions were amortized over the project's estimated 50-year lifetime because construction emissions are confined to a relatively short period of time in relation to the overall life of the proposed project.

a. Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Pursuant to BAAQMD guidance, the project's GHG emissions would be less than significant if the project includes no natural gas appliances or plumbing; would not result in wasteful, inefficient, or unnecessary energy usage; would achieve lower-than-average project-generated VMT consistent with CARB's 2022 Scoping Plan or a locally adopted VMT target; and would achieve compliance with CALGreen Tier 2 requirements for off-street electric vehicle spaces (BAAQMD 2022). The project does not include natural gas connections, and as discussed in Section 6, *Energy*, the project would not result in wasteful, inefficient, or unnecessary energy usage. Due to enhanced system functions, the project would result in a net decrease in routine inspections and maintenance trips and their associated VMT, as detailed in Section 17, *Transportation*. In addition, CALGreen Tier 2

requirements for off-street electric vehicle spaces are not applicable to the project because no residential or nonresidential buildings would be constructed, and the project would not include parking. Therefore, the project would include the requisite project design elements, as applicable, and pursuant to BAAQMD guidance, the project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. Impacts would be less than significant.

Although impacts would be less than significant as discussed above, calculations of CO_2, methane, and nitrous oxide emissions are provided to disclose the magnitude of GHG emissions generated by the project for informational purposes. Project construction would generate temporary GHG emissions as a result of the use of construction equipment on-site as well as from vehicles transporting construction workers to and from the project site and heavy trucks transporting new materials and exported soil. As shown in Table 9, project construction would generate approximately 479 MT of CO_2e in total, or approximately 9.6 MT of CO_2e per year when amortized over a 50-year period (i.e., the expected lifetime of the proposed project for the purposes of this analysis).

Table 9 Estimated Construction GHG Emissions

Construction Year	Emissions (MT of CO_2e per year)
2025 (Total)	479
Total Amortized over 50 Years	**9.6**

MT = metric tons; CO_2e = carbon dioxide equivalents
See Appendix A for CalEEMod results.

Operation of the project would include routine inspections and maintenance of infrastructure; however, maintenance trips and their associated GHG emissions would be reduced in comparison to existing conditions due to the improved condition of the pipeline after replacement. No adverse operational impact would occur.

LESS THAN SIGNIFICANT IMPACT

b. Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Neither CAWD nor Carmel-by-the-Sea have not adopted a qualified GHG reduction plan. Monterey County adopted its Municipal Climate Action Plan (MCAP) in 2013, which outlines steps the County is taking to reduce GHG emissions and potential paths towards the County's goal of reducing GHG emissions to a level 15 percent below 2005 emissions by 2020. The horizon year of the 2013 MCAP has passed and Monterey County has initiated efforts to update the plan; however, the project would not conflict with the 2013 MCAP because the project would improve the efficiency of the existing wastewater system, thereby reducing operational GHG emissions associated with electricity usage and routine maintenance trips. For the same reason, the project would be consistent with the 2022 Scoping Plan and would not conflict with SB 32 emissions targets because the project would improve the efficiency and reduce operational GHG emissions. The project would not emit a substantial quantity of GHG emissions, as discussed under item (a). Therefore, the project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, and there would be no impact.

NO IMPACT

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?	☐	☐	■	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	■	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?	☐	☐	■	☐
d. Be located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	■	☐
e. For a project located in an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	■
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	■	☐	☐
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	■	☐

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Construction of the project would temporarily increase the transport and use of hazardous materials in the vicinity of the project alignment through the operation of vehicles and equipment. Such substances include diesel fuel, oil, solvents, and other similar materials brought onto the construction site for use and storage during the construction period. These materials would be contained within vessels specifically engineered for safe storage and would not be transported, stored, or used in quantities which would pose a significant hazard to the public or construction workers themselves. Furthermore, project construction would require the excavation and transport of paving materials and soils which could possibly be contaminated by vehicle-related pollution (e.g., oil, gasoline, diesel, and other automotive chemicals). All such paving and soils removed during construction would be transported and disposed of in accordance with applicable codes and regulations to ensure no significant hazard to construction workers or the surrounding community would occur.

Operation of the project would involve the conveyance of wastewater and would not require the use, storage, or disposal of hazardous materials. Therefore, the project would not create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project 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?

The use, transport, and storage of hazardous materials during construction of the project (e.g., diesel fuel, oil, solvents, and other similar materials) could introduce the potential for an accidental spill or release to occur. As discussed under item (a) above, operation and maintenance of the project would not involve the routine transport, use, or disposal of hazardous materials. Therefore, potential impacts are limited to the construction period.

The presence of hazardous materials during project construction activities, including but not limited to ground-disturbing activities such as excavating and trenching, could result in an accidental upset or release of hazardous materials if they are not properly stored and secured. Hazardous materials used during project construction would be disposed of offsite in accordance with all applicable laws and regulations, including but not limited to the California Building and Fire Codes, as well regulations of the federal and State Occupational Safety and Health Administrations. Therefore, the project would not create a significant hazard to the public or the environment through release of hazardous construction materials. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?

The nearest school to the project site is Carmel River Elementary School, with a portion of the project alignment located immediately to the east of the school property. There are no other schools within 0.25 mile of the project alignment. As described under items (a) and (b) above, an accidental spill or release of hazardous or potentially hazardous materials such as vehicle and equipment fuels could occur during project construction. Hazardous materials used during project

construction would be disposed of off-site in accordance with all applicable laws and regulations, including but not limited to the California Building and Fire Codes, as well regulations of the federal and State Occupational Safety and Health Administrations. Operation of the project would involve the conveyance of wastewater and would not require the use, storage, or disposal of hazardous materials. Therefore, potential impacts associated with an accidental emission or release of hazardous materials in proximity to a school would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project be located on a site that is included on a list of hazardous material 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?

The following databases compiled pursuant to Government Code Section 65962.5 were checked for known hazardous materials contamination:

- EnviroStor Database, California Department of Toxic Substances Control (DTSC)
- GeoTracker Database, California SWRCB

According to the database search, there are no known hazardous material sites on or near the project site (DTSC 2023; SWRCB 2023a). The nearest listed cleanup site is the Carmel Middle School Expansion (case 60002757), approximately 1.5 miles east of the easternmost portion of the project alignment on Dolores Street. EnviroStor classifies the site as a School Investigation, with its status listed as "Inactive – Needs Evaluation." Due to its inactive status and distance from the project site, this case does not present a hazard in relation to the proposed project. The project would not be located on a site that is included on a list of hazardous material sites. As such, contaminated soils are not anticipated to be encountered during construction. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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 closest public or private airport to the project site is the Monterey Regional Airport, located approximately 5.2 miles northeast of the northernmost portion of the project alignment. The project alignment is not located within the airport's Airport Influence Area (Monterey County Airport Land Use Commission 2019). There would be no impacts related to public airport safety hazards.

NO IMPACT

f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Both the City of Carmel-by-the-Sea and the County of Monterey have Emergency Operations Plans that establish emergency response policies and procedures, and identify responsibilities of key officials and agencies to ensure the effective management of emergencies and disasters within the City. The City's Emergency Operations Plan provides information on the City emergency management structure, the protocols for when emergency procedures are activated, and the procedures for notification and activation (Carmel-by-the-Sea 2021). The Emergency Operations Plan recognizes that in the event of a tsunami, Carmel Beach would be primarily affected. Similarly,

the Monterey County Emergency Operations Plan establishes emergency response and evacuation protocols for different emergency scenarios for unincorporated areas of the County, and contains plan annexes for each city within the County (County of Monterey 2021). The County Emergency Operations Plan also identifies tsunamis as a primary hazard of coastal jurisdictions. The City's Emergency Operations Plan refers to the Monterey County Operational Area Tsunami Incident Response Plan (TIRP) for specific tsunami related guidance. The County level TIRP has an annex that details a response plan specific to the City of Carmel-by-the-Sea (Monterey County 2007).

Construction of the proposed project would require temporary lane closures, which could impair emergency response plans outlined in City and County Emergency Operations Plans. As described further in Section 17, *Transportation,* Mitigation Measure TR-1 would require the project contractor to prepare and implement a traffic control plan that specifies how traffic will be safely and efficiently redirected during work along the project alignment. Implementation of the traffic control plan would ensure adequate emergency access during project construction. Operation of the replacement pipeline would be similar to existing conditions, limited to routine maintenance activity. Maintenance needs would be reduced in comparison with existing conditions due to the improved condition of the pipeline after replacement. The pipeline would be located underground and therefore would not obstruct access to any roadways or structures. No other construction or land use changes are proposed. Therefore, the project's potential impacts on emergency response or evacuation would be limited to temporary and minor circulation impacts due to construction traffic; potential impacts related to the impairment of implementation of, or physical interference with, an adopted emergency response plan or emergency evacuation plan would be less than significant with implementation of Mitigation Measure TR-1.

Mitigation Measures

Refer to Mitigation Measure TR-1 in Section 17, *Transportation*.

Significance After Mitigation

As discussed in Section 17, *Transportation*, Mitigation Measure TR-1 would require the project contractor to prepare and implement a traffic control plan that specifies how traffic will be safely and efficiently redirected during work along the project alignment. Implementation of the traffic control plan would ensure adequate emergency access during project construction and would reduce project related impacts to a less than significant level with mitigation incorporated.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

h. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

The project alignment is located within a Local Responsibility Area for Fire Protection Responsibility, as designated by CALFIRE. The nearest Very High Fire Hazard Severity Zones are 600 feet north of the northern staging area along Ocean Avenue, and 700 feet northwest of the southern staging area near Dolores Street (CALFIRE 2023). The proposed project would not add residents, visitors, or structures along the project alignment that would increase exposure to wildfire hazards. During construction activities, the use of spark-producing construction machinery within or adjacent to areas of moderate and high fire hazard could potentially create hazardous fire conditions and expose people to risk of wildland fires. However, California Public Resources Code (PRC) Section 4442 mandates the use of spark arrestors, which prevent the emission of flammable debris from exhaust, on earth-moving and portable construction equipment with internal combustion engines

operating on any forest-covered, brush-covered, or grass-covered land. Therefore, compliance with applicable regulations would ensure impacts related to potential risk of loss, injury, or death associated with wildland fires during construction are less than significant. Operation of the project would not increase the population or introduce any project elements that would potentially increase the risk of loss, injury, or death associated with wildland fires. Therefore, this impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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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?	☐	☐	■	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	■	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
(i) Result in substantial erosion or siltation on- or off-site;	☐	☐	■	☐
(ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	☐	☐	■	☐
(iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	■	☐
(iv) Impede or redirect flood flows?	☐	☐	■	☐
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	■	☐
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	■

a. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

b. Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The project alignment is located in the Central Coast hydrological region, within the Carmel Valley Alluvial Groundwater Basin. The nearest surface water body is the Carmel River, which runs east to west approximately 400 feet to the south of the southeasternmost portion of the project alignment. The Monterey Peninsula area currently relies heavily on the Carmel River and Carmel Valley Aquifer located within the Carmel Valley Alluvial Groundwater Basin for its water supply (U.S. Bureau of Reclamation 2017). The Monterey Peninsula Water Management District (MPWMD) is the Groundwater Sustainability Agency for the Carmel Valley Alluvial Groundwater Basin. In the spring of 2016, the California Department of Water Resources agreed with the SWRCB determination that water in the basin flows through known and definite subterranean channels and is, therefore, not subject to Sustainable Groundwater Management Act (SGMA) requirements. As a result, there is no available groundwater sustainability management plan for this basin.

The project involves the replacement of existing wastewater pipelines beneath existing roadways. No groundwater supplies would be utilized for this project and groundwater recharge would not be reduced due to increased impervious surfaces, as the project area is already paved. Impervious surface area along the project alignment would be similar to existing conditions; as such, there would be no increase in paved surface area that could substantially interfere with groundwater recharge.

Construction would occur in a developed area. The new pipeline would replace an existing pipeline at a depth ranging from 5 to 10 feet below the surface. According to the geotechnical report completed for the project, groundwater was encountered at depths of eight to 11 feet below the surface (Appendix D). Dewatering plans would be prepared and implemented and would include measures for proper disposal of groundwater to ensure impacts to surface water quality do not occur. In addition, any groundwater dewatering would be anticipated to be minimal; therefore, project construction would not substantially decrease groundwater.

Excavation, trenching, and construction activities associated with project construction would result in soil disturbance. As stormwater flows over a construction site, it can pick up sediment, debris, and chemicals, and transport them to receiving water bodies, including the Carmel River and the Pacific Ocean. Although most pipeline replacement would occur via pipe bursting, which involves limited ground disturbance, total ground disturbance during construction would be greater than one acre (approximately 1.7 acres). As such, the project would require compliance under the statewide NPDES Construction General Permit for demolition and construction-related water quality impacts administered by the State Water Resources Control Board, and CAWD would be required to comply with NPDES requirements to reduce pollutants in stormwater runoff. The NPDES Permit Program, authorized by the Clean Water Act, controls water pollution by regulating sources that discharge pollutants into waters of the United States. The Construction General Permit requires preparation and implementation of a SWPPP and implementation of BMPs during demolition and construction. Furthermore, MCC Chapter 16.14, *Urban Stormwater Quality Management and Discharge Control*, requires that a SWPPP be prepared in accordance with the Statewide Construction General Permit for any construction activity requiring a NPDES Permit. The SWPPP would minimize the amount of sediment and other pollutants associated with the construction site discharged in stormwater runoff (SWRCB 2023b). Compliance with NPDES requirements and

implementation of BMPs would include erosion and sediment control BMPs to prevent or reduce water pollution which would reduce impacts related to degradation of surface and ground water quality to a less than significant level. In addition, ground disturbance at any one location would be temporary and short-term because construction would be continually moving along the pipeline alignment. Furthermore, construction activities would be halted during a storm event and any open excavation and trenching areas would be plated and covered at the end of each day and prior to a predicted storm event. Therefore, the project would not violate any water quality standards and impacts to groundwater would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c.(i) Would the project 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 result in substantial erosion or siltation on- or off-site?

c.(ii) Would the project 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 substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

c.(iii) Would the project 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 that 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?

c.(iv) Would the project 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 impede or redirect flood flows?

The project involves replacement of existing sewer mains in developed areas. The project would not alter the course of a stream or river as replacement pipelines are proposed to be located in the same location as the existing pipeline. As discussed in Section 4, *Biological Resources*, no permanent alterations to the existing concrete drainage within the project alignment are proposed. Additionally, as described above under items (a) and (b), the project would not increase the amount of impervious surface along the pipeline alignment because the pipeline would be installed under existing pervious surfaces which would be restored to existing conditions upon completion of construction.

Although construction activities for pipeline installation would involve trenching and other pipeline installation methods that would disturb both paved roadways and unpaved land within the project alignment, any disturbance would be temporary in nature. All construction activities would be required to comply with Carmel-by-the-Sea Municipal Code Chapter 17.43, *Water Quality Protection Ordinance*, and Monterey County's Construction Site BMP Handbook and the Construction BMPs-Plan Sheet which would reduce impacts related to erosion, surface runoff, dust control, and waste/material management (County of Monterey 2015). After construction, the project area would be restored to its original condition, and any drainage pattern along the project alignment would be returned to existing conditions following project construction activities. Therefore, the proposed pipeline would not alter the existing drainage pattern along the project alignment as compared to existing conditions. Impacts would be less than significant.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps, the project alignment borders a 100-year flood hazard area (FEMA 2023). Because the proposed pipeline would be located entirely underground, the pipeline would not risk release of pollutants due to project inundation. In addition, Monterey County Zoning Code Section 16.16.050(F) sets standards for utilities including that sanitary sewage systems are designed to minimize or eliminate infiltration of flood waters into the system and discharge from systems into flood waters. All pipelines would be underground, would be designed to comply with American Water Works Association standards to minimize or eliminate infiltration, and would not increase impervious surfaces in a manner which would impede or redirect flood flows. Implementation of existing requirements would reduce impacts to less than significant.

LESS THAN SIGNIFICANT IMPACT

d. In flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation?

As discussed in item (c)(iv), the project area is alongside a 100-year flood hazard area. Additionally, as discussed in Section 9, *Hydrology and Water Quality,* item (f), City and County Emergency Operations Plans identified Carmel Beach as an area at risk of flooding from tsunamis. However, as discussed above in item (c)(iv), regulations for development within this zone would reduce the risk of release of pollutants to less than significant.

LESS THAN SIGNIFICANT IMPACT

e. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

In September 2014, the Sustainable Groundwater Management Act (SGMA) was enacted to provide a framework for sustainable management of groundwater supplies by local authorities, with a limited role for intervention when necessary to protect the resource. As mentioned previously, the MPWMD is the Groundwater Sustainability Agency for the Carmel Valley Alluvial Groundwater Basin. In the spring of 2016, DWR agreed with the SWRCB determination that water in the basin flows through known and definite subterranean channels and is, therefore, not subject to SGMA requirements. As a result, there is no sustainable groundwater management plan or water quality control plan for this basin. Therefore, no impact would occur.

NO IMPACT

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?	☐	☐	☐	■
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?	☐	☐	■	☐

a. Would the project physically divide an established community?

The proposed project would replace an existing sewer pipeline and rehabilitate a wastewater lift station. The new pipeline would be located entirely below ground and would be situated similarly and function similarly to the existing pipeline. Construction would be temporary in nature and would preserve pedestrian access to nearby residences and other uses, including Carmel Beach, the Carmel River Elementary School, the Mission Ranch hotel and restaurant, and the Carmel Mission, during ground disturbing activities. Once installed, the pipeline would require maintenance on an as-needed basis. The project would not install or construct any new above ground infrastructure and the site would be returned to existing conditions after construction has ceased. Therefore, the project would not have the potential to physically divide an established community and there would be no impact.

NO IMPACT

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

The proposed project alignment would be located within the City of Carmel-by-the-Sea and the County of Monterey. The project site is in the coastal zone and is subject to Carmel-by-the-Sea's Local Coastal Program (LCP) and the County of Monterey's Carmel Area LUP. The project may qualify for a Coastal Development Permit (CD) exemption as a repair and maintenance activity which would require coordination between the City and County and the California Coastal Commission. However, if it is determined that an exemption is not possible, then consistent with Section 17.52.090(D) of the Carmel Municipal Code, separate Coastal Development Permit (CDP) applications are anticipated to be required for each jurisdiction. The City and County would review and approve the CDP applications, which would ensure that the project is consistent with the provisions of the City and County General Plans and LCPs, the California Coastal Act, and the California Code of Regulations Title 14 Division 5.5 (California Coastal Commission). The project would be consistent with policies of the City's General Plan and the County's Carmel Area LUP that aim to avoid or mitigate environmental effects, including but not limited to City Policy P5-188, which encourages

proper maintenance of wastewater infrastructure to project sensitive areas; and County Policy 2.3.2, which encourages siting of infrastructure outside of environmentally sensitive habitat areas. Therefore, impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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?	☐	☐	☐	■
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?	☐	☐	☐	■

a. Would the project 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?

b. Would the project 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?

According to Mineral Land Classification Maps prepared by the DOC, the project site is not underlain by a known mineral resource (DOC 2023d). The proposed project would not involve mineral extraction, construction, or changes in land use that could affect the availability of mineral resources. Therefore, there would be no impact to mineral resources.

NO IMPACT

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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?	☐	■	☐	☐
b. Generation of excessive groundborne vibration or groundborne noise levels?	☐	■	☐	☐
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	■

Overview of Noise and Vibration

Noise

Sound is a vibratory disturbance created by a moving or vibrating source, which is capable of being detected by the hearing organs. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment (Caltrans 2013).

HUMAN PERCEPTION OF SOUND

Noise levels are commonly measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels so that they are consistent with the human hearing response. Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used to measure earthquake magnitudes. A doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; dividing the energy in half would result in a 3 dB decrease (Caltrans 2013).

DESCRIPTORS

The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important factors of project noise impact. Most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors have been developed. The noise descriptors used for this analysis are the equivalent noise level (L_{eq}) and the community noise equivalent level (CNEL).

The L_{eq} is one of the most frequently used noise metrics; it considers both duration and sound power level. The L_{eq} is defined as the single steady-state A-weighted sound level equal to the average sound energy over a time period. When no time period is specified, a 1-hour period is assumed. The L_{max} is the highest noise level within the sampling period, and the L_{min} is the lowest noise level within the measuring period. Normal conversational levels are in the 60 to 65-dBA L_{eq} range; ambient noise levels greater than 65 dBA L_{eq} can interrupt conversations (Federal Transit Administration [FTA] 2018).

Noise that occurs at night tends to be more disturbing than that occurring during the day. Community noise is usually measured using CNEL, which is the 24-hour average noise level with a +5 dBA penalty for noise occurring from 7:00 p.m. to 10:00 p.m. and a +10 dBA penalty for noise occurring from 10:00 p.m. to 7:00 a.m. (Caltrans 2013).

Groundborne Vibration

Groundborne vibration of concern in environmental analysis consists of the oscillatory waves that move from a source through the ground to adjacent buildings or structures and vibration energy may propagate through the buildings or structures. Vibration may be felt, may manifest as an audible low-frequency rumbling noise (referred to as groundborne noise), and may cause windows, items on shelves, and pictures on walls to rattle. Although groundborne vibration is sometimes noticeable in outdoor environments, it is almost never annoying to people who are outdoors. The primary concern from vibration is that it can be intrusive and annoying to building occupants at vibration-sensitive land uses and may cause structural damage.

Typically, ground-borne vibration generated by manmade activities attenuates rapidly as distance from the source of the vibration increases. Vibration amplitudes are usually expressed in peak particle velocity (PPV) or root mean squared (RMS) vibration velocity. The PPV and RMS velocity are normally described in inches per second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is often used as it corresponds to the stresses that are experienced by buildings (Caltrans 2020a).

High levels of groundborne vibration may cause damage to nearby buildings or structures; at lower levels, groundborne vibration may cause minor cosmetic (i.e., non-structural damage) such as cracks. These vibration levels are nearly exclusively associated with high impact activities such as blasting, pile-driving, vibratory compaction, demolition, drilling, or excavation. Table 10 summarizes the vibration damage criteria recommended by the FTA for evaluating the potential for architectural damage to buildings.

Table 10 Criteria for Vibration Damage Potential

Type of Situation	Limiting Velocity (in/sec PPV)
I. Reinforced concrete, steel, or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Nonengineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

in/sec = inches per second; PPV = peak particle velocity
Source: FTA 2018

Project Noise Setting

Sensitive Receivers

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. Noise sensitive receptors generally include schools, parks, residential areas, hospitals, churches, courts, libraries, and care facilities. While neither CAWD, the City, nor the County define specific noise-sensitive land uses, the County does define noise compatibility standards for the following land uses: residential (low-density, single-family, duplex, mobile homes), residential (multi-family), transient lodging (hotels, motels), schools, libraries, churches, hospitals, and nursing homes. The nearest sensitive receivers along the pipeline are existing single-family residences immediately adjacent to pipeline segments on several roadways.

Ambient Noise Levels

According to the City of Carmel-by-the-Sea General Plan/Local Coastal LUP Noise Element, the most prevalent noise source in the City is from traffic on State Route 1. Additional noise sources include the following: Ocean Avenue; truck and bus routes; individual vehicles; trash pick-up; and street sweepers (City of Carmel-by-the-Sea 2009b). The project site is located largely along residential streets within the City of Carmel-by-the-Sea and portions of unincorporated Monterey County and is not located near State Route 1. There are no major noise sources outside of regular residential noise in this area.

Regulatory Setting

CAWD has not adopted noise thresholds for construction or operational activities; therefore, thresholds and policies set forth by both the City of Carmel-by-the-Sea and the County of Monterey are utilized in this analysis.

Section 8.56 of the City's Municipal Code specifies that "Class B" noise (including but not limited to noise created by power equipment and tools, appliances, workshops, vehicle repairs and testing, and construction projects) shall not be created or emitted between the hours of 6:30 p.m. of one day and 8:00 a.m. of the following day. The City does not have a quantitative threshold for construction noise. Therefore, this analysis utilizes thresholds contained in the 2010 Monterey County General Plan and the MCC as described below.

Monterey County Code

MCC Chapter 10.60 enforces construction and operational noise regulations. MCC Section 10.60.030 prohibits the operation of machinery that exceeds 85 dBA at 50 feet at any time of day. MCC Section

10.60.040 limits nighttime noise levels to 45 dBA L_{eq} and 65 dBA L_{max} at 50 feet between 9:00 p.m. and 7:00 a.m. MCC Section 10.60.040(C) provides exemptions to compliance with the exterior nighttime noise level standards, including for equipment used in an emergency, which is defined as a situation arising from fire, explosion, act of God, or act of public enemy which, if not corrected immediately, will potentially result in the loss of life, property or substantial environmental resources. However, there is no exemption provided for nighttime construction noise. The MCC does not include quantitative standards for groundborne vibration.

a. Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction Noise

Project construction activities would generate temporary noise in the project site vicinity, exposing sensitive receivers located adjacent to the project alignment to increased noise levels. Construction noise would be generated by heavy-duty diesel construction equipment used for site preparation, trenching, paving, drilling, and ground restoration activities. Each phase of construction has a specific equipment mix and associated noise characteristics, depending on the equipment used during that phase. Construction noise would be short-term and temporary at the individual locations of project components given that construction at each location would only occur for a fraction of the overall nine-month construction period.

Although the City of Carmel-by-the-Sea does not have a quantitative threshold for construction noise, noise generated within the City's jurisdiction is conservatively compared to County of Monterey thresholds. MCC Section 10.60.030 prohibits the operation of machinery that exceeds 85 dBA at 50 feet at any time of day. However, the nearest sensitive receivers to the project site are located approximately 25 feet from noise generated by construction equipment. Given the proximity of sensitive receivers to the project site, this analysis assumes a threshold of 85 dBA at 25 feet rather than the established threshold of 85 dBA at 50 feet. This represents a conservative analysis because 85 dBA would attenuate to approximately 79 dBA at 25 feet.

Construction noise was estimated using the Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM, 2006). Typical construction projects have long-term noise averages that are lower than louder short-term noise events due to equipment moving from one point to another on the site, work breaks, and idle time. Pipeline construction activities would be mobile and would be constantly moving in a linear path along the project alignment. Pipeline construction activities would occur near sensitive receivers (single-family residences located along Scenic Road, Camino Real, 14th Avenue, Dolores Street, Carmelo Street, etc.). As discussed above, mobile equipment associated with pipeline construction activities would operate at an average distance of 25 feet from the nearest sensitive receiver. Pipeline construction would involve the use of an excavator and a front-end loader. With these pieces of equipment operating concurrently, the hourly noise level at 50 feet from the pipeline construction area is calculated to be 79 dBA $L_{eq.}$ Therefore, at the nearest noise-sensitive receiver to the project alignment, pipeline construction activities would generate maximum hourly noise levels up to 85 dBA L_{eq}. Table 11 summarizes pipeline construction noise levels at the nearest noise-sensitive receiver.

Table 11 Pipeline Construction Noise

Location	dBA L_{eq} (8-hour)
Reference Distance (50 feet)	79
Single-Family Residences Immediately Adjacent (25 feet)	85

Mitigation Measure NOI-1 is included to ensure that construction contractors limit noise to below the MCC's daytime construction noise limit of 85 dBA to ensure that project construction noise levels would not exceed construction noise thresholds. Furthermore, construction noise impacts at any one residence during pipeline construction would be temporary and short-term because construction would be continuously moving along the project alignment. In addition, construction activities would be restricted to daytime hours per Section 8.56 of the City's Municipal Code and Section 10.60 of the MCC, which restrict construction noise to between the hours of 8:00 a.m. and 6:30 p.m. and the hours of 7:00 a.m. and 9:00 p.m., respectively. Typically, construction work would end no later than 5 p.m. No nighttime construction would occur. With implementation of Mitigation Measure NOI-1, impacts from construction noise would be less than significant.

Operational Noise

Upon completion, project components would resume operating in a similar fashion to existing conditions. Therefore, project operation would not generate a substantial permanent increase in ambient noise levels in the vicinity of the project alignment, and impacts would be less than significant.

Mitigation Measures

NOI-1 Construction Noise Reduction

During project construction, the project contractor shall ensure that construction noise levels at the adjacent single-family residential uses are reduced to a noise level not to exceed the Monterey County Code's construction noise threshold of 85 dBA Leq and shall implement the following measures:

- At the construction area, provide a sign that includes a 24-hour telephone number for project information, and a procedure where a field engineer/construction manager respond to and investigate noise complaints and take corrective action, if necessary, in a timely manner.
- If a noise complaint(s) is registered, the contractor and CAWD shall conduct noise measurements at the use(s) that registered the complaint and modify the means and methods of construction to maintain noise levels below the 85 dBA at 25 feet threshold.
- The following measures may also be used to reduce noise levels:
  - The use of bells, whistles, alarms, and horns shall be restricted to safety warning purposes only.
  - Noise-reducing enclosures shall be used around stationary noise-generating equipment (e.g., compressors and generators) or located as far from sensitive receptors, as feasible.

Significance After Mitigation

With implementation of noise reduction measures as described in Mitigation Measure NOI-1, construction noise levels would not exceed the MCC construction noise threshold of 85 dBA L_{eq}. Therefore, impacts from pipeline construction would be less than significant with Mitigation Measure NOI-1.

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b. Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Construction Vibration

Pursuant to Policy S-7.8 of the 2010 Monterey County General Plan, construction equipment that creates vibrations that could cause structural damage to structures within 100 feet of the construction area require additional vibrational analysis. CAWD, the City of Carmel-by-the-Sea, and County of Monterey have not adopted quantitative standards to assess vibration impacts during construction and operation. However, the FTA has developed limits for the assessment of vibrations from transportation and construction sources. The FTA vibration limits are reflective of standard practice for analyzing vibration impacts on structures from continuous and intermittent sources. The thresholds of significance used in this analysis to evaluate vibration impacts are based on these impact criteria, as summarized in Table 10, above.

Project construction may require operation of vibratory equipment such as large bulldozers and loaded trucks within five feet of structures at the Mission Ranch hotel and restaurant, a historic site, which under FTA vibration guidelines may be a building extremely susceptible to vibration damage. Other historic sites along the project alignment, including the Carmel Mission, were determined to be unaffected by groundborne vibration based on the distance of the pipeline alignment from the Mission buildings. As shown in Table 12, vibration levels from individual pieces of construction equipment would exceed 0.12 in/sec PPV during operation of large bulldozers, which is the threshold at which damage can occur to buildings extremely susceptible to vibration damage. The distance at which a large bulldozer would not exceed 0.12 in/sec PPV would be 21 feet; therefore, if a large bulldozer or other similar equipment is used within 21 feet of the Mission Ranch hotel and restaurant, vibration impacts could be potentially significant. Project construction would not occur within 25 feet of residential structures; at a distance of 25 feet, Project construction would not exceed the threshold for residential structures.

Table 12 Vibration Levels at Sensitive Receivers - Unmitigated

Equipment	Estimated in/sec PPV at Nearest Building
Historic Building (Mission Ranch hotel and restaurant) – 5 feet	
Large Bulldozer	0.52
Loaded Truck	0.45
Threshold For Structural Damage to Buildings Extremely Susceptible to Vibration Damage	**0.12**
Threshold Exceeded?	Yes
Residential Buildings – 25 feet	
Large Bulldozer	0.089
Loaded Truck	0.076
Threshold For Nonengineered Timber and Masonry Buildings	**0.20**
Threshold Exceeded?	No

in/sec = inches per second; PPV = peak particle velocity

Table 13 shows estimated vibration levels with incorporation of Mitigation Measure NOI-2, which states that construction activities using heavy-duty equipment within 21 feet of the historic structures located on the Mission Ranch hotel and restaurant property would be conducted with off-road equipment that is limited to 100 horsepower or less. As shown therein, with a small bulldozer, vibration levels would not exceed the AASHTO threshold of 0.12 in/sec PPV within 5 feet of the historic buildings. Similar small equipment that does not exceed 100 horsepower would be anticipated to have similar vibration levels. Therefore, this impact would be less than significant with mitigation incorporated.

Table 13 Vibration Levels at Sensitive Receivers - Mitigated

Equipment	Estimated in/sec PPV at Nearest Building (5 feet)
Small Bulldozer	0.018
Threshold For Structural Damage to Buildings Extremely Susceptible to Vibration Damage	**0.12**
Threshold Exceeded?	No

in/sec = inches per second; PPV = peak particle velocity

Operational Vibration

The proposed project does not include components with the potential to generate significant vibration during operation, such as manufacturing or heavy equipment. No operational vibration impact would occur.

Mitigation Measures

NOI-2 Construction Vibration Requirements for Historic Structures

Prior to the issuance of grading permits, CAWD shall confirm the following measure is included as notes on all construction plans:

- Construction activities using heavy-duty equipment within 21 feet of the historic structures located on the Mission Ranch hotel and restaurant property shall be conducted with off-road equipment that is limited to 100 horsepower or less.

Significance After Mitigation

As shown in Table 13, implementation of Mitigation Measure NOI-2 would reduce vibration impacts to less than significant.

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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 nearest airport to the project site is the Monterey Regional Airport, located approximately 4.6 miles to the south of the southernmost portion of the project alignment. The project site is not located within this airport's Airport Influence Area (Monterey County Airport Land Use Commission 2019). Because the project site is not located in the vicinity of a private airstrip, airport land use plan, or within two miles of a public or public use airport, the project would not expose people residing or working in the project area to excessive aircraft-related noise. No impact would occur.

NO IMPACT

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 (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	■
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	■

a. Would the project 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)?

b. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

The project would involve replacement of an existing sewer pipeline and rehabilitation of a wastewater lift station. This would not increase wastewater capacity, nor would it include any new connections to residences or other nearby uses, such as the Carmel River Elementary School, the Mission Ranch hotel and restaurant, and the Carmel Mission. The project does not include housing or other infrastructure that would lead to population growth. Project construction would involve short disruptions of wastewater service during lateral reconnection of four hours or less per lateral. As such, residents would not be temporarily displaced during construction due to lack of service. The project would not displace housing or residents. Because the project would not induce population growth or displace people or housing, there would be no impact.

NO IMPACT

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15 Public Services

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a.	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
	1 Fire protection?	☐	☐	☐	■
	2 Police protection?	☐	☐	☐	■
	3 Schools?	☐	☐	☐	■
	4 Parks?	☐	■	☐	☐
	5 Other public facilities?	☐	☐	☐	■

a.1. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities, or the need for new or physically altered fire protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

a.2. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered police protection facilities, or the need for new or physically altered police protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

a.3. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered schools, or the need for new or physically altered schools, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives?

a.5. Would the project result in substantial adverse physical impacts associated with the provision of other new or physically altered public facilities, or the need for other new or physically altered public facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

As described in Section 14, *Population and Housing*, the project does not include development of structures or infrastructure that would directly or indirectly increase the population in the City of Carmel-by-the-Sea or the County of Monterey. Therefore, service ratios for facilities and staff for public services, including fire protection, police protection, schools, or other public facilities, would not be impacted. During construction, full or partial intermittent road closure of Scenic Road, Santa Lucia Avenue, San Antonio Avenue, Valley View Avenue, 15th Avenue, Carmelo Street, Camino Real, 14th Avenue, and Dolores Street would be required during normal working hours. Emergency vehicles would be given priority access during road closures. The traffic control plan would require notification of local emergency response providers prior to the start of work when lane and road closures are required, which would ensure emergency access is maintained during project construction. To maintain service during pipe bursting activities along Scenic Road and near Carmel River Elementary School, wastewater would be bypassed around the work area from an upstream manhole through an on-grade pipeline and discharged to a downstream manhole. As such, no disruptions to school service would occur during project construction. No impacts to other public facilities, such as libraries, would occur. Therefore, the project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, and would not impact service ratios, response times, or other performance objectives for fire protection services, police protection services, schools, or other public facilities. No impact would occur.

NO IMPACT

a.4. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered parks, or the need for new or physically altered parks, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives?

During construction, full or partial intermittent road closure of Scenic Road, Santa Lucia Avenue, San Antonio Avenue, Valley View Avenue, 15th Avenue, Carmelo Street, Camino Real, 14th Avenue, and Dolores Street would be required during normal working hours, which could affect access to the beach and walking paths along Scenic Road. This is considered a potentially significant impact to parks. However, as specified in Mitigation Measure PS-1, pedestrian access to the beach and walking path along Scenic Road would be maintained during project construction. Temporary detours do not constitute new recreational facilities as they would not involve any permanent improvements. In addition, detours would be temporary, and neither the beach nor the walking path would be permanently altered as part of the project. Therefore, with implementation of Mitigation Measure PS-1, impacts to parks would be less than significant.

Mitigation Measure

PS-1 Pedestrian Access to Recreational Areas along Scenic Road

During construction, the project contractor shall maintain pedestrian access to the beach and walking path along Scenic Road. The project contractor shall ensure that detours do not limit visitors' ability to access the beach and walking path on the west side of Scenic Road. Where project construction obstructs designated road crossings, the project contractor shall designate a pedestrian detour around the work area, routing pedestrians a maximum of 50-feet around the construction disturbance area. The project contractor shall also provide temporary curb ramps as needed to facilitate pedestrian access to/from the street. Additionally, the project contractor shall

construct a majority of the pipeline replacement along Scenic Road during the off-season in order to limit the number of visitors required to utilize a detour.

Significance After Mitigation

Impacts to parks would be less than significant with implementation of Mitigation Measure PS-1.

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16 Recreation

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	■	☐	☐
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?	☐	■	☐	☐

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?

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?

As described in Section 14, *Population and Housing*, the project does not include development of structures or infrastructure that would directly or indirectly increase the population in the City of Carmel-by-the-Sea or the County of Monterey. Therefore, the project would not increase the population served by local recreation facilities or otherwise result in increased demand for or degradation of those facilities.

During construction, full or partial intermittent road closure of Scenic Road, Santa Lucia Avenue, San Antonio Avenue, Valley View Avenue, 15th Avenue, Carmelo Street, Camino Real, 14th Avenue, and Dolores Street would be required during normal working hours, which could affect access to the beach and walking paths along Scenic Road. This is considered a potentially significant impact to recreation. However, as required by Mitigation Measure PS-1, pedestrian access to the beach and walking path along Scenic Road would be maintained during project construction. Detours would be temporary, and neither the beach nor the walking path would be permanently altered as part of the project. The project would not increase the use of the beach or walking path, nor would it require the construction or expansion of recreational facilities.

The project would utilize two staging areas during construction for storage of construction materials, equipment, and vehicles. The southern staging area is not located within the vicinity of any recreational areas. The northern staging area would be located at the Ocean Avenue Beach parking lot at the north end of Scenic Road and would require the temporary use of up to 16 parking spaces from January to April 2025. Additionally, approximately four street parking spaces would be utilized within road closure areas for staging. This area would move as work areas move along the project alignment. Project effects to parking spaces would be minimized to the extent practical, as staging and construction in this area would avoid the peak summer months.. Any project-related

effects to these parking spaces would be temporary and would cease upon project completion, and parking availability would return to pre-project conditions. Further, as stated above, pedestrian access to the beach and walking path along Scenic Road would be maintained during project construction. For the reasons discussed above, impacts would be less than significant with implementation of Mitigation Measure PS-1.

Mitigation Measure

Refer to Mitigation Measure PS-1 in Section 15, *Public Services*.

Significance After Mitigation

Impacts to recreational facilities would be less than significant with implementation of Mitigation Measure PS-1.

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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?	☐	■	☐	☐
b. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	■	☐
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)?	☐	☐	☐	■
d. Result in inadequate emergency access?	☐	■	☐	☐

a. Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Approximately half of the project alignment would be located along Scenic Road. The Circulation Element of the City's General Plan identified that Scenic Road typically has more than adequate parking and usually does not experience congestion; however, during peak periods such as during the summer or sunny weekends, the Circulation Element recognized that parking on Scenic Road is not adequate. The Circulation Element also contains Policy P2-9, "review the traffic patterns on Scenic Road." In addition, the Circulation Element recognized Scenic Road to be a "prime bike route in the City," although it is a one-way street and cyclists cannot travel north. Scenic Road also serves pedestrians and provides access to Carmel Beach. Other portions of the project alignment would be located on Santa Lucia Avenue, Carmelo Street, Dolores Street, and other adjacent roadways within the City and County. The City of Carmel-by-the-Sea Circulation Element identifies Carmelo Street and Santa Lucia Avenue as Monterey-Salinas Transit routes, and Dolores Street as a bicycle route (City of Carmel-by-the-Sea 2010).

Project construction would result in temporary transportation impacts. The project would intermittently require full or partial closure of Scenic Road, Santa Lucia Avenue, San Antonio Avenue, Valley View Avenue, 15th Avenue, Carmelo Street, Camino Real, 14th Avenue, and Dolores Street during construction. Construction and potholing would require up to nine days of closure on Scenic Road from Ocean Avenue to 8th Avenue; up to 20 days of closure from 8th Avenue to 13th Avenue; and up to 17 days of closure from 13th Avenue and Bay Avenue. Construction and potholing on 14th and 15th Avenues would require up to 5 days of closure. Construction and potholing would require one day of closures on Santa Lucia Avenue, San Antonio Avenue, and Valley View Avenue, and up to two days of closure on Camino Real and Dolores Street. In addition, during

repaving, access to each individual residence would be unavailable for up to two days on Scenic Road between 8th Street and Bay View Avenue, and for up to one day along the remainder of the project alignment.

During construction, full or partial intermittent road closure of Scenic Road, Santa Lucia Avenue, San Antonio Avenue, Valley View Avenue, 15th Avenue, Carmelo Street, Camino Real, 14th Avenue, and Dolores Street would be required during normal working hours, which could affect access to the beach and walking paths along Scenic Road. This is a potentially significant impact to a pedestrian facility. However, as required by Mitigation Measure PS-1, pedestrian access to the beach and walking path along Scenic Road would be maintained during project construction. Detours would be temporary, and neither the beach nor the walking path would be permanently altered as part of the project.

Access to the Carmel River Elementary School would be maintained during all times, including the normally scheduled drop-off and pick-up times. Access to the Mission Ranch hotel and restaurant would be maintained; however, approximately five parking spaces may be disrupted to accommodate the pipe bursting access pits, minor open trench construction, open trench excavation around manholes, and the relocation of one manhole.

The northern construction staging area, within the Ocean Avenue beach parking lot, would require temporary use of up to 16 parking spaces. Construction-related vehicle trips would include construction workers traveling to and from the project work zones and staging areas, haul trucks (including for import and export of excavated materials, as needed), and other trucks associated with equipment and material deliveries. In addition, hauling of wastewater would be required during construction. At the southern end of the project alignment on Santa Lucia Avenue, 10 trucks per day for two days would be needed during force main replacement. All collected wastewater would be hauled to other points in the wastewater system and discharged into manholes. Construction is anticipated to start in January 2025 and be completed in September 2025. Construction would be prioritized along Scenic Road to avoid construction in this area during peak summer months.

Because construction is a short-term, temporary activity and trips would account for a relatively small portion of existing traffic on area roadways, construction-related traffic impacts would not be substantial. Construction would be phased, and closures would only apply to the areas being affected at the time. Residents would be provided vehicular access to their properties during construction activities. However, replacement of the sewer mains and reconnection of the sewer laterals would require portions of the roads in the project alignment to be shut down to all non-resident through traffic. Street parking would not be available during street closures. Residents and property owners would be notified of road closures via notice letters and door hangers, and an informational phone number would be established. Signage would be provided around the project alignment during road closures, and pedestrian access to the beach will remain accessible at other points outside the project alignment.

During operation, the proposed replacement pipeline would be completely underground and would involve occasional, infrequent vehicle trips for maintenance. Operation of the pipeline would not conflict with a program, plan, ordinance, or policy addressing the circulation system.

For the reasons discussed above, impacts would be less than significant with implementation of Mitigationo Measure PS-1.

Mitigation Measure

Refer to Mitigation Measure PS-1 in Section 15, *Public Services*.

Significance After Mitigation

Impacts related to conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities would be less than significant with implementation of Mitigation Measure PS-1.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

b. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

CEQA Guidelines Section 15064.3(b) identifies criteria for evaluating transportation impacts. Specifically, the guidelines state vehicle miles travelled (VMT) exceeding an applicable threshold of significance may indicate a significant impact. According to Section 15064.3(b)(3) of the *CEQA Guidelines*, a lead agency may include a qualitative analysis of operational and construction traffic if existing models or methods are not available to estimate the VMT for the particular project being considered. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. Pursuant to Section 15064.3(c), the provisions of this section area applicable statewide as of July 1, 2020. Neither CAWD, the City of Carmel-by-the-Sea, or Monterey County have established VMT thresholds. The 2018 Monterey County Active Transportation Plan includes Policy C-2.4, which encourages a reduction in the number of VMT per person (County of Monterey 2018). In the absence of local thresholds, guidance from the Office of Planning and Research's *Technical Advisory on Evaluating Transportation Impacts in CEQA* is used. These guidelines state that projects that generate vehicle travel at a level 15 percent below existing VMT, impacts would be less than significant.

A quantitative VMT analysis for construction is not required by CEQA. SB 743 is focused on reducing long-term VMT to help achieve the State's greenhouse gas reduction targets. Even though one particular project may generate a large number of construction trips, the number of construction-generated VMT for an individual project is incidental and temporary when compared to the total VMT in a jurisdiction generated by residential, commercial, and office uses. The *Technical Advisory on Evaluating Transportation Impacts in CEQA* from the California Office of Planning and Research, which is intended to provide guidance on addressing VMT in CEQA documents pursuant to SB 743, does not mention construction-phase VMT analysis (OPR 2018). Although not expressly required under CEQA or SB 743, CEQA Guidelines Section 15064.3(3) acknowledges that "a qualitative analysis of construction traffic may be appropriate." Further, as discussed in *Transportation Analysis Under CEQA, First Edition* by Caltrans, "Impacts associated with construction of a project may also require VMT analysis, particularly for large projects or projects located a considerable distance from urbanized areas. Generally, a qualitative analysis of VMT impacts associated from the construction of the project would be appropriate" (Caltrans 2020b; p. 20). Although the project site is located in an urbanized area, a qualitative analysis is provided below for informational purposes.

Section 15064.3(a) of the State CEQA Guidelines define VMT as the "amount and distance of automobile travel attributable to a project." The OPR guidelines further state, "Here, the term 'automobile' refers to on-road passenger vehicles, specifically cars and light trucks" (OPR 2018). Therefore, truck trips are generally excluded from the requirements of CEQA as they pertain to transportation impacts and VMT. Analysis of temporary, construction related VMT from

transporting of construction materials, which would occur via large truck, is therefore not required. VMT from construction worker vehicles would be limited. Construction workers would be expected to be drawn from the existing local or regional workforce. Because construction jobs would be filled by local workers, it is not anticipated that workers would be travelling long distances to get to and from the job site. Further, these trips would not be "new," but rather a redistribution of existing trips. Depending on the route of redistribution, trip lengths could be reduced for some local construction workers. Any VMT generated during the construction phase would be temporary and cease upon construction completion. This is consistent with Caltrans' *Transportation Analysis Under CEQA, First Edition*, which states that "[v]ehicle trips used for construction purposes would be temporary, and any generated VMT would generally be minor and limited to construction equipment and personnel and would not result in long-term trip generation" (Caltrans 2020b; p. 20).

As discussed under item (a) above, traffic on local roadways would be temporarily increased during project construction due to worker trips and the necessary transport of construction vehicles and equipment along the project alignment. Increases in VMT from construction would be short-term, minimal, and temporary.

In terms of operation, maintenance of the proposed project would require less frequent vehicle trips to the site in comparison to existing conditions due to the improved condition of the pipeline after replacement. Thus, operational VMT would decrease as compared to existing conditions. Overall, the project would not conflict or be inconsistent with *CEQA Guidelines* Section 15064.3(b) and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)?

The project would not involve the construction of new roads or reconfiguration of any roadways or intersections that could result in a substantial increase in traffic hazards. During project construction, construction vehicles would utilize two staging areas: the existing Ocean Avenue Beach parking lot at the northernmost terminus of the project alignment and an undeveloped lot at the southeasternmost terminus of the project alignment. Operation of the new pipeline would not result in an increase in vehicle trips to the site, as described above. No impact would occur.

NO IMPACT

d. Would the project result in inadequate emergency access?

Full or partial intermittent road closure of Scenic Road, Santa Lucia Avenue, San Antonio Avenue, Valley View Avenue, 15th Avenue, Carmelo Street, Camino Real, 14th Avenue, and Dolores Street would be required during normal working hours during construction. Residents would be provided vehicular access to their properties during project construction activities. However, replacement of the sewer mains and reconnection of the sewer laterals would require portions of the roads in the project alignment to be shut down to all non-resident through traffic. Street parking would not be available during street closures. Residents would have to park in their driveway or outside the road closure area. Access to the Carmel River Elementary School would be maintained at all times, including during the normally scheduled drop-off and pick-up times. No closures on the primary access routes to the school would be allowed during drop-off and pick-up times. Access to the Mission Ranch hotel and restaurant would be maintained; however approximately 5 to 10 parking

spaces may be disrupted to accommodate the pipe bursting access pits, open trench excavation around manholes, and the relocation of one manhole. Due to the potential for portions of the project alignment to be shut down to all through traffic, impacts would be potentially significant.

To reduce impacts on emergency vehicle access, the project contractor would prepare and implement a traffic control plan that specifies how traffic will be safely and efficiently redirected during work along the project alignment.

Implementation of the traffic control plan, as discussed in Mitigation Measure TR-1, would ensure adequate emergency access during project construction. In operation, the pipeline would be completely underground and would not impact the use of roadways along the project alignment. Therefore, impacts would be less than significant with mitigation.

Mitigation Measures

TR-1 Traffic Control Plan

The project contractor shall prepare and implement a traffic control plan that specifies how traffic will be safely and efficiently redirected during work along the project alignment. All work shall comply with the standards and guidance of the California Manual on Uniform Traffic Control Devices. Traffic control measures in the event of a lane and road closure shall be included, and priority access shall be given to emergency vehicles. Prior to the start of construction, emergency response providers and homeowners along the project alignment shall be notified by the project contractor of the planned construction and construction schedule. The traffic control plan shall also include requirements to notify local emergency response providers at least one week prior to the start of work when lane and road closures are required. Property owners and residents shall also be notified at least one week prior to the start of work when lane and road closures are required that may disrupt access to their property.

Other traffic control measures included in the Traffic Control Plan may include, but would not be limited to, the following:

- Limiting the number of parking spaces used by project staging and construction workers.
- Providing shuttles for construction workers to access the project work area.
- Maintaining access to the beach and walking path at all times.
- Providing residents access to their driveways at all times (with a maximum of 10 minutes of wait time).

Significance After Mitigation

Implementation of Mitigation Measure TR-1, which requires preparation of a traffic control plan, would reduce project related impacts to emergency access to a less than significant level.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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18 Tribal Cultural Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in a Public Resources Code Section 21074 as either a site, feature, place, or cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?	☐	■	☐	☐
b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of 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.	☐	■	☐	☐

AB 52 of 2015 expanded CEQA by defining a new resource category, "tribal cultural resources." AB 52 states "a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment" (PRC Section 21084.2). It further states the lead agency shall establish measures to avoid impacts altering the significant characteristics of a tribal cultural resource, when feasible (PRC Section 21084.3). PRC Section 21074 (a)(1)(A-B) defines tribal cultural resources as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" and is:

1. Listed or eligible for listing in the CRHR or in a local register of historical resources as defined in PRC Section 5020.1(k); or
2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC Section 5024.1(c). In applying these criteria, the lead agency shall consider the significance of the resource to a California Native American tribe.

AB 52 also establishes a formal consultation process for California tribes regarding those resources. The consultation process must be completed before a CEQA document can be certified or adopted. Under AB 52, lead agencies are required to "begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project." Native American tribes to be included in the process are those having requested notice of projects proposed in the jurisdiction of the lead agency.

Pursuant to PRC 21080.3.1 and AB 52, CAWD sent notification letters via United States Postal Service Certified Mail to the following Native American tribes that are traditionally and culturally affiliated with the project site:

- Amah Mutsun Tribal Band
- Amah Mutsun Tribal Band of Mission San Juan Bautista
- Costanoan Ohlone Rumsen-Mutsen Tribe
- Costanoan Rumsen Carmel Tribe
- Esselen Tribe of Monterey County
- Indian Canyon Mutsun Band of Costanoan
- Ohlone/Costanoan-Esselen Nation
- Wuksache Indian Tribe/Eshom Valley Band
- KaKoon Ta Ruk Band of Ohlone-Costanoan Indians of the Big Sur Rancheria
- Rumsen Am:a Tur:ataj Ohlone

Follow-up emails were sent on August 11, 2023.

The Ohlone/Costanoan-Esselen Nation (OCEN) and the Esselen Tribe of Monterey County have requested consultation with CAWD pursuant to Public Resources Code Section 21080.3.1, and also suggested cultural resources training and monitoring be included in project construction. Additionally, the KaKoon Ta Ruk Band of Ohlone-Costanoan Indians of the Big Sur Rancheria responded with a request to include cultural monitors during project development and ground disturbance, and to incorporate the tribe's treatment protocol for the inadvertent discovery of human remains into the mitigation measures for this IS-MND. Given that implementation of Section 15064.5(e)(1) of the CEQA Guidelines, Health and Safety Code Section 7050.5(c), and Public Resources Code Section 5097.98 is required by law for the discovery and treatment of human remains and adequately address the potential for discovery of human remains (as discussed in item [d] in Section 5, *Cultural Resources*), the KaKoon Ta Ruk Band of Ohlone-Costanoan Indians of the Big Sur Rancheria's protocols are not included as mitigation herein. The protocols were not included to avoid incorporating mitigation that may conflict with existing statutes or with another tribe's protocols (if another tribe is identified as the Most Likely Descendant) governing the process for the inadvertent discovery of human remains. No other responses were received from other tribes, and the consultation window closed on August 26, 2023.

a. Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074 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)?

b. Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074 that is 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?

Rincon contacted the NAHC on April 21, 2023 to request a search of the SLF. The NAHC responded on May 18, 2023 stating that the results of the SLF search were positive. Additionally, responses

from the OCEN, the Esselen Tribe of Monterey County, and the KaKoon Ta Ruk Band of Ohlone-Costanoan Indians of the Big Sur Rancheria indicated the cultural importance and sensitivity of the area near the project alignment.

Project excavation and ground disturbance could disturb tribal cultural resources, and could cause a substantial adverse change in their significance. Consequently, impacts to tribal cultural resources are potentially significant.

Mitigation Measure TCR-1 would require Native American monitoring during project ground disturbing activities. Mitigation Measure TCR-2 would be required to avoid and minimize potential impacts to tribal cultural resources.

Mitigation Measures

TCR-1 Native American Monitoring

CAWD shall retain a Native American monitor associated with one or more of the Native American groups that have expressed interest in the project to monitor all project-related ground disturbance stipulated in Mitigation Measure CUL-3. The monitors shall have the authority to halt and redirect work should any Native American archaeological resources be identified during monitoring. If Native American archaeological resources are encountered during ground-disturbing activities, work within 100 feet of the find shall halt, and, as outlined in Mitigation Measure CUL-3, shall not resume until a treatment plan is developed by a Qualified Archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for archaeology in either prehistoric or historic archaeology.

As outlined in Mitigation Measure CUL-3, all ground disturbing activities within a 250-foot radius around archaeological resources P-27-000152, -000153, -000154, -001323, and -002482 shall be subject to Native American monitoring, and all initial ground disturbance outside the 250-foot resource buffers be subject to Native American monitoring. Native American monitoring within the 250-foot buffer around the archaeological resources shall not be reduced. However, Native American monitoring outside the 250-foot buffer may be reduced to spot-checking or eliminated at the discretion of the monitor, in consultation with CAWD, as warranted by conditions such as encountering bedrock, sediments being excavated are fill, or negative findings during the first 60 percent of excavation. As outlined in Mitigation Measure CUL-3, the CRMP shall include figures depicting the pipeline segments wherein monitoring may be reduced and the segments wherein monitoring may not be reduced. The GIS data used to develop these figures may be used by CAWD and their contractor to incorporate into the project engineering plans.

If monitoring is reduced to spot-checking, spot-checking shall occur when ground-disturbance moves to a new location within the project site and when ground disturbance would extend to depths not previously reached (unless those depths are within bedrock). The Native American monitor shall prepare daily monitoring logs that include a description of construction activities, hours worked, and other applicable observations. In the event Native American archaeological resources are identified, they shall be described in the daily monitoring log and CAWD shall be notified.

TCR-2 Unanticipated Discovery of Tribal Cultural Resources

In the event that cultural resources of Native American origin are identified during construction, the project contractor shall temporarily suspend or redirect all earth-disturbing work within 100 feet of the find and shall immediately contact the Qualified Archaeologist. Work shall be suspended and

redirected until the Qualified Archaeologist has evaluated the nature and significance of the find as a cultural resource and CAWD has consulted with an appropriate local Native American representative, and the Qualified Archaeologist and CAWD authorize re-initiation of construction within 100 feet of the find. If CAWD, in consultation with local Native American tribes, determines that the resource is a tribal cultural resource and thus significant under CEQA, a mitigation plan shall be prepared and implemented in accordance with state guidelines, in consultation with local Native American group(s), and the treatment protocol of the affiliated group(s). The plan shall include avoidance of the resource or, if avoidance of the resource is infeasible, the plan shall outline the appropriate treatment of the resource in coordination with the appropriate local Native American tribal representative and, if applicable, the Qualified Archaeologist. The plan shall include measures to ensure the find is treated in a manner that respectfully retains, to the degree feasible, the qualities that render the resource of significance to the local Native American group(s). Examples of appropriate mitigation for tribal cultural resources include, but are not limited to, protecting the cultural character and integrity of the resource, protecting traditional use of the resource, protecting the confidentiality of the resource, or heritage recovery.

Significance After Mitigation

Implementation of Mitigation Measure TCR-1 and TCR-2, which require Native American monitoring and outline protocols in the event that cultural resources of Native American origin are identified during project construction, would reduce project related impacts to tribal cultural resources to a less than significant level.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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?	☐	☐	■	☐
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	■	☐
c. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	■	☐
d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid Waste reduction goals?	☐	☐	■	☐
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	■	☐

a. Would the project 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?

c. Would the project 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?

Water

The proposed project would not expand the potable water system or increase potable water pipeline capacity to serve additional customers. The project would replace an existing wastewater pipeline that connects to the CAWD sewer system. The replaced sewer mains would not induce an increase in population that would increase demands for water service. Pipe bursting activities would have the potential to damage existing water mains in close proximity to the project alignment due to their age (over 100 years old). To avoid impacts to these existing water mains, the location of the water mains would be determined prior to the construction by submitting a request to the Underground Service Alert. Where water mains are located within three feet of pipe bursting of the existing sewer main, the construction contractor would be required to excavate and expose the water main, which would allow the soils around the watermain to shift without damaging the water main. Accordingly, impacts related to water facilities would be less than significant.

Wastewater Treatment

CAWD collects and processes wastewater from Carmel-by-the-Sea and surrounding areas. CAWD provides collection, treatment, and disposal of wastewater for 11,000 residents within its service area and treatment and disposal for an additional 4,500 people in Del Monte Forest through a contract agreement with Pebble Beach Community Services District. CAWD maintains 81 miles of sewers within the existing service area, comprised of approximately 5.5 square miles (CAWD 2023).

The proposed project would replace an existing sewer pipeline and rehabilitate a wastewater lift station. The proposed project would serve existing residents and other nearby properties, including the Carmel River Elementary School, the Mission Ranch hotel and restaurant, and the Carmel Mission, as it would replace the existing wastewater conveyance system with upgraded infrastructure. The project itself would not generate wastewater, and no new or expanded wastewater treatment facilities would be required. Further, the additional conveyance of wastewater to the CAWD treatment plant could provide for additional reclaimed water available for landscape irrigation, thereby reducing the strain on the local potable water resources. Wastewater service for individual residences would be disrupted during main replacement and lateral reconnection. However, this is anticipated to be a temporary disruption and would only occur for four hours or less per lateral during reconnection. Wastewater service would not be interrupted to any other properties along the project alignment. For further discussion regarding wastewater service disruption, refer to “Wastewater Service Disruption” in the *Project Description*. Because the project is a replacement of an existing facility and would not generate new wastewater nor increase capacity, impacts to wastewater treatment and demand would be less than significant.

Stormwater Drainage

As discussed in Section 10, *Hydrology and Water Quality*, construction of the proposed pipeline would not increase the amount of impervious surface along the project alignment because a majority of the pipeline would be installed under existing pervious roadways that would be restored to existing conditions upon completion of construction. At the southeastern most portion of the alignment, east of Carmel River Elementary School, the pipeline would be installed in a pervious area, which would be returned to its existing condition upon project completion and would not result in the addition of any impervious surface area. Additionally, most of the alignment would be added via pipe bursting, a trenchless method of replacing buried pipelines, to reduce ground disturbance and the need for additional impervious surfaces. Therefore, the proposed pipeline would not alter the drainage pattern along the project alignment and would not increase

stormwater flow such that new or expanded stormwater drainage systems would be necessary. Impacts would be less than significant.

Electric Power and Natural Gas

As discussed in Section 6, *Energy*, operational energy demand would be similar to existing conditions. The pipeline itself would not generate new demand for electricity or natural gas. Project operation would include routine inspections and maintenance. Maintenance needs are expected to be reduced in comparison to existing conditions due to the improved condition of the pipeline after replacement. No new electric or gas infrastructure would be required that could cause significant environmental effects due to the proximity of existing connections. Impacts would be less than significant.

Telecommunications

The project would not involve any components requiring telecommunications infrastructure and is not anticipated to involve the relocation of existing telecommunications facilities. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

The project consists of the replacement of a sewer pipeline. Small quantities of water would be required during construction for dust suppression, which would be potable water provided by a water truck. Water consumption associated with dust suppression would be temporary and minimal because only disturbed areas would need to be watered. Operation of the proposed project would not increase water consumption. Therefore, the project would have sufficient water supplies to serve the project and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

e. Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Construction activities may temporarily generate solid waste, including soil spoils or other construction waste, which would be disposed of in accordance with all applicable federal, State, and local statutes and regulations. While up to 300 cy of soil is expected to be reused as backfill material within the project alignment, up to 4,200 cy of soil could be disposed of off-site. Table 14 shows the landfills that the City and County direct solid waste to. Data for solid waste generated by local jurisdictions is not available at the County-level; therefore, only City solid waste tonnage is shown.

Due to the temporary nature of construction and minimal amount of construction waste anticipated to require disposal, the project would not generate quantities of solid waste that would account for a substantial percentage of the total daily regional permitted capacity available at the above landfills. If contaminated soils are encountered, transport, treatment, and disposal of soils would be subject to federal, state, and local regulations, as outlined in Section 9, *Hazards and Hazardous*

Materials. Therefore, waste generated by demolition and construction activities would not exceed the available capacity at the landfill serving the project area that would accept debris generated by the project.

Table 14 Solid Waste Facilities and Capacities

Landfill	2018 City Tonnage	Remaining Capacity	Daily Permitted Capacity (cubic yards)
Monterey Peninsula Landfill	6,463.01	97%	3,500
Altamont Landfill & Resource Recovery	26.31	53%	11,150
Kirby Canyon Recycling and Disposal Facility	12.27	44%	2,600
Recology Hay Road	2.37	82%	2,400

Source: CalRecycle 2018

The project would be required to comply with all applicable laws and regulations related to solid waste generation, collection, and disposal. The project would result in a short-term and temporary increase in solid waste generation during construction but would not substantially affect standard solid waste operations of any landfill accepting waste. Recycling and reuse activities during construction would comply with the California Integrated Waste Management Act of 1989 (AB 939). Once operational, the project would include unmanned facilities and would not generate solid waste. Therefore, solid waste impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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

a. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

The project alignment is located in a Local Responsibility Area for fire protection, as designated by CALFIRE. The nearest Very High Fire Hazard Severity Zones are 600 feet north of the northern staging area along Ocean Avenue, and 700 feet northwest of the southern staging area near Dolores Street (CALFIRE 2023). The proposed project would not add residents or visitors to the area near the project alignment and would not add structures that would increase wildfire exposure or hazards. As discussed in Section 17, *Transportation*, a minimal increase in traffic near the project alignment would occur during the project's construction phase. However, construction traffic would be temporary and would not impair emergency response or evacuation. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project, 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 proposed project would replace a wastewater pipeline and rehabilitate a wastewater lift station. The project would not alter the existing environmental conditions along the project alignment, other than for temporary ground disturbing activities required to remove and replace the existing pipeline. Heavy duty equipment used during project construction may produce sparks with the potential to ignite vegetation. However, PRC Section 4442 mandates the use of spark arrestors, which prevent the emission of flammable debris from exhaust, on earth-moving and portable construction equipment with internal combustion engines operating on any forest-covered, brush-covered, or grass-covered land. Furthermore, PRC Sections 4427 and 4431 specify standards for conducting construction activities on days when a burning permit is required, and PRC Section 4428 requires construction contractors to maintain fire suppression equipment during the highest fire danger period (April 1 to December 1) when operating on or near any forest-covered, brush-covered, or grass-covered land. Therefore, with compliance with applicable PRC provisions, project construction would not exacerbate wildfire risk. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project 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 require the installation or maintenance of any infrastructure, such as roads or fuel breaks, associated with fire prevention. Therefore, the project would not exacerbate existing fire hazards, and there would be no impact.

NO IMPACT

d. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project 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 not add residents or visitors near the project alignment and would not add structures that would increase wildfire exposure or hazards. Additionally, the proposed replacement pipeline would be underground within a relatively flat area. After conclusion of construction activity, environmental conditions along the project alignment would be restored to a stable condition similar to existing conditions. Therefore, impacts would be temporary and would not substantially increase hazards or expose people or structures to flooding or landslides as a result of post-fire runoff, slope instability, or drainage changes. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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

a. Does the project 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?

The project is limited to activities that would occur at the project site, which is developed with existing roadways. The project is local and does not include large-scale activities that would pose a substantial threat to species populations. Therefore, the project would not substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or substantially reduce the number or restrict the range of a rare or endangered plant or animal. As discussed in Section 5, *Cultural Resources*, the project would result in a potentially significant impact to historic and archaeological

resources. However, implementation of Mitigation Measure NOI-2, as discussed in Section 13, *Noise*, would reduce groundborne vibration levels at Mission Ranch structures to below levels that could cause structural damage to this historic resource. Potential impacts to archaeological resources would be reduced to a less than significant level with implementation of Mitigation Measures CUL-1 through CUL-3, which require CAWD to retain a qualified archaeologist, conduct archaeological resources sensitivity training for construction personnel, and prepare and implement a CRMP during construction. As discussed in Section 18, *Tribal Cultural Resources*, Mitigation Measures TCR-1 and TCR-2 require Native American monitoring and outline protocols in the event that cultural resources of Native American origin are identified during project construction, which would reduce project impacts to a less than significant level. With implementation of Mitigation Measures CUL-1 through CUL-3, TCR-1, and TCR-2, the project would not eliminate important examples of major periods of California history or pre-history. Impacts would be less than significant with mitigation incorporated.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

b. Does the project 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)?

As described in the discussion of environmental checklist Sections 1 through 20, with respect to all environmental issues, the proposed project would not result in significant and unmitigable impacts to the environment; all anticipated impacts associated with project construction and operation would be either less than significant or less than significant with mitigation incorporated. This is largely because project construction activities would be temporary, and project operational activities would not significantly alter the environmental baseline condition. In addition, upon the completion of construction, there would be a reduction in the operation and maintenance needs of the sewer mains when compared to baseline conditions because the project would include repairs and enhance existing system functions.

Cumulative impacts could occur if the construction of other projects occurs at the same time as the proposed project and in the same geographic scope, such that the effects of similar impacts of multiple projects combine to create greater levels of impact than would occur at the project-level. For example, if the construction of other projects in the area occurs at the same time as project activities, combined air quality and noise impacts may be greater than at the project-level.

There are four planned development projects in the vicinity of the project site, which are summarized in Table 15. The exact implementation timing of these projects is not known at this time; therefore, it is conservatively assumed that construction of these planned projects could overlap with construction of the proposed project.

Table 15 Cumulative Development Projects

No.	Project Name	Project Location	Project Components	Status
Carmel-by-the-Sea				
1	2021/2022 Street Repairs	Various roadways in Carmel-by-the-Sea	Curb, sidewalk, and paving improvements to several roadways in the city, including but not limited to San Antonio Avenue from 4th Avenue to Ocean Avenue; San Antonio Avenue from 8th Avenue to Ocean Avenue; and Dolores Street from 5th Avenue to 6th Avenue	Environmental review complete
2	DS 22-150 and DS 22-151	Southeast corner of Guadalupe Street and 1st Avenue	Construction of two single family residences	Planning approval received from City in January 2023
3	Ulrika Plaza	Southeast corner of Dolores Street and 5th Avenue	Construction of approximately 38,000 square feet of mixed-use retail and residential across four lots	Planning approval received from City in August 2023
4	JB Pastor Building	Southeast corner of Dolores and 7th Avenue	Construction of a two-story mixed use building	Project design under City review
Monterey County				
5	PLN230274	2657 16th Avenue	Renovation of existing single family residence to add 690 square foot second level and 40 square foot addition to existing first floor	Planning application submitted September 2023
6	PLN230257	24965 Hatton Road	Renovation of existing single family residence to construct a guesthouse and 245 square foot addition to existing dwelling	Planning application under County review
7	DA230135	26357 Scenic Road	Exterior window, siding, and door renovations to existing single family residence	Design approval permit cleared
8	DA220319	3405 3rd Avenue	Addition of 187 square feet to master bedroom, 69 square feet to dining room, and 50 square feet to laundry room	Design approval permit cleared
9	PLN220117	24726 Dolores Street	Construction of a 3,817 square foot single family residence	Planning application complete in April 2022

Source: City of Carmel-by-the-Sea 2023; County of Monterey 2023b

Project impacts are primarily temporary, localized effects that would occur during construction activities. Therefore, the potential for the project to contribute to cumulative impacts would be limited to the infrequent periods of project activities and the following issue areas:

- **Air Quality.** Because the NCCAB is designated nonattainment-transitional for the ozone CAAQS and nonattainment for the PM_{10} CAAQS, cumulative air quality impacts currently exist for these pollutants. As discussed in Section 3, *Air Quality*, project construction activities would not generate emissions of this air pollutant exceeding MBARD significance thresholds, which are

intended to assess whether a project's contribution to existing cumulative air quality impacts is considerable. Therefore, the project's contribution to cumulative air quality impacts would not be cumulatively considerable.

- **Biological Resources.** Most cumulative impacts to biological resources occur when a disproportionate number of development projects occur at once and regionally impact a local population of a special status species, riparian habitat, sensitive natural communities, wetlands, or other locally protected biological resources. In this case, all cumulative projects would occur within previously developed areas. Due to the nature of these projects and the discretionary approvals required for each one, these development projects would be required to undergo CEQA review, if they have not already, to identify the extent of these biological resources impacts and to mitigate those impacts appropriately. Given the uncertainty in the extent of impacts associated with these projects, this analysis conservatively assumes a significant cumulative impact to biological resources would occur. Nevertheless, the proposed project would be required to implement Mitigation Measures BIO-1 through BIO-5 to reduce its impacts to biological resources to a less than significant level such that project-level impacts would not result in a cumulatively considerable contribution to this cumulative impact.
- **Cultural and Tribal Cultural Resources.** Cumulative development in the region would disturb areas with the potential to contain cultural and tribal cultural resources. Cumulative projects would occur in previously developed areas, and would therefore have a low potential to encounter previously undiscovered cultural and tribal cultural resources. In addition, as mentioned above, the cumulative development projects have undergone or would be required to undergo CEQA review, which would determine the extent of potential cultural and tribal cultural resources impacts and mitigate those impacts appropriately. If these cumulative projects would result in impacts to known or unknown cultural or tribal cultural resources, impacts to such resources would be addressed on a case-by-case basis. Given the uncertainty in the extent of impacts associated with these projects, this analysis conservatively assumes a significant cumulative impact to cultural and tribal cultural resources would occur. Nevertheless, the proposed project would be required to implement Mitigation Measures CUL-1 through CUL-3, NOI-2, TCR-1, and TCR-2 to reduce its impacts to cultural and tribal cultural resources to a less than significant level such that project-level impacts would not result in a cumulatively considerable contribution to this cumulative impact.
- **Greenhouse Gas Emissions.** GHG emissions and climate change are, by definition, cumulative impacts. As discussed in Section 8, *Greenhouse Gas Emissions*, the adverse environmental impacts of cumulative GHG emissions, including sea level rise, increased average temperatures, more drought years, and more large forest fires, are already occurring. As a result, cumulative impacts related to GHG emissions are significant. Thus, the issue of climate change involves an analysis of whether a project's contribution towards an impact is cumulatively considerable. As discussed in Section 8, *Greenhouse Gas Emissions*, project emissions would be below the identified threshold of significance and would therefore not be cumulatively considerable.
- **Hazards and Hazardous Materials.** Similar to the proposed project, cumulative projects would be required to comply with regulations applicable to the use, disposal, and transportation of hazardous materials during construction activities, and compliance with applicable regulations would reduce potential cumulative impacts to less than significant levels. With respect to the use and accidental release of hazardous materials in the environment at construction, effects are generally limited to site-specific conditions. Therefore, cumulative impacts related to accidental release of hazardous materials would be less than significant.

- **Noise.** Overlapping construction activities associated with cumulative development projects in conjunction with proposed project activities could result in cumulative noise impacts related to a temporary increase in ambient noise levels at the same noise-sensitive receivers located throughout the area, especially during construction activities. However, similar to the proposed project, cumulative development projects would be subject to compliance with the noise level limits established in Carmel Municipal Code Chapter 8.56 and Monterey County Code Chapter 10.60. Therefore, cumulative construction noise impacts would be less than significant.
- **Transportation.** Overlapping construction schedules associated with cumulative development projects in conjunction with proposed project activities could result in cumulative transportation impacts. Similar to the proposed project, cumulative projects would be required to prepare traffic control plans, which would minimize impacts to transportation hazards and emergency access. The project would require fewer maintenance trips in operation compared to existing conditions; accordingly, there would be no cumulative operational impact. Therefore, cumulative transportation impacts would be less than significant.

Given the above discussion, the proposed project would not result in a cumulatively considerable contribution to a significant cumulative impact with mitigation incorporated.

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c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Adverse effects on human beings are typically associated with air quality, hazards and hazardous materials, noise, and wildfire impacts. These impacts are addressed in Section 3, *Air Quality*, Section 9, *Hazards and Hazardous Materials*, Section 13, *Noise,* and Section 20, *Wildfire*. As discussed in Section 9, *Hazards and Hazardous Materials,* Section 13, *Noise,* and Section 17*, Transportation,* the project would implement Mitigation Measure TR-1, which would ensure adequate emergency access during project construction. As discussed in Section 13, *Noise*, Mitigation Measures NOI-1 and NOI-2 would reduce noise and vibration impacts to less than significant. Impacts related to air quality and wildfire would be less than significant without mitigation. With incorporation of mitigation measure TR-1, NOI-1, and NOI-2, the project would have a less than significant impact on human beings.

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Appendix A

California Emissions Estimator Model (CalEEMod) Results

CAWD Scenic Road Pipeline Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	CAWD Scenic Road Pipeline
Construction Start Date	1/1/2025
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.80
Precipitation (days)	27.6
Location	36.54772698914378, -121.92743972043658
County	Monterey
City	Carmel-by-the-Sea
Air District	Monterey Bay ARD
Air Basin	North Central Coast
TAZ	3244
EDFZ	6
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.19

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Road Widening	1.02	Mile	1.80	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.69	3.92	34.0	39.3	0.08	1.48	1.99	3.47	1.36	0.29	1.66	—	8,947	8,947	0.39	0.23	3.32	9,029
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.69	3.91	34.1	39.2	0.08	1.48	1.99	3.47	1.36	0.29	1.66	—	8,930	8,930	0.39	0.23	0.09	9,009
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.56	1.31	11.3	13.4	0.03	0.48	0.60	1.08	0.44	0.09	0.53	—	2,875	2,875	0.12	0.06	0.41	2,896
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.28	0.24	2.06	2.45	< 0.005	0.09	0.11	0.20	0.08	0.02	0.10	—	476	476	0.02	0.01	0.07	479

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2025	4.69	3.92	34.0	39.3	0.08	1.48	1.99	3.47	1.36	0.29	1.66	—	8,947	8,947	0.39	0.23	3.32	9,029
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	4.69	3.91	34.1	39.2	0.08	1.48	1.99	3.47	1.36	0.29	1.66	—	8,930	8,930	0.39	0.23	0.09	9,009
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.56	1.31	11.3	13.4	0.03	0.48	0.60	1.08	0.44	0.09	0.53	—	2,875	2,875	0.12	0.06	0.41	2,896
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.28	0.24	2.06	2.45	< 0.005	0.09	0.11	0.20	0.08	0.02	0.10	—	476	476	0.02	0.01	0.07	479

3. Construction Emissions Details

3.1. Linear, Grubbing & Land Clearing (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.58	0.49	4.22	4.50	0.01	0.24	—	0.24	0.22	—	0.22	—	632	632	0.03	0.01	—	634
Dust From Material Movement	—	—	—	—	—	—	0.21	0.21	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.22	0.23	< 0.005	0.01	—	0.01	0.01	—	0.01	—	32.9	32.9	< 0.005	< 0.005	—	33.0
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	< 0.005	0.04	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.45	5.45	< 0.005	< 0.005	—	5.47
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.05	0.54	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	85.2	85.2	0.01	< 0.005	0.01	86.4
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.45	4.45	< 0.005	< 0.005	0.01	4.53
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.74	0.74	< 0.005	< 0.005	< 0.005	0.75
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Linear, Grading & Excavation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.39	3.69	32.6	36.9	0.07	1.46	—	1.46	1.35	—	1.35	—	7,645	7,645	0.31	0.06	—	7,671
Dust From Material Movement	—	—	—	—	—	—	1.45	1.45	—	0.16	0.16	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.39	3.69	32.6	36.9	0.07	1.46	—	1.46	1.35	—	1.35	—	7,645	7,645	0.31	0.06	—	7,671
Dust From Material Movement	—	—	—	—	—	—	1.45	1.45	—	0.16	0.16	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.93	0.78	6.87	7.78	0.01	0.31	—	0.31	0.28	—	0.28	—	1,613	1,613	0.07	0.01	—	1,618
Dust From Material Movement	—	—	—	—	—	—	0.31	0.31	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.14	1.25	1.42	< 0.005	0.06	—	0.06	0.05	—	0.05	—	267	267	0.01	< 0.005	—	268
Dust From Material Movement	—	—	—	—	—	—	0.06	0.06	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.22	0.20	0.14	1.93	0.00	0.00	0.28	0.28	0.00	0.07	0.07	—	307	307	0.02	0.01	1.27	313
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	19.7	19.7	< 0.005	< 0.005	0.05	20.6
Hauling	0.08	0.02	1.24	0.47	0.01	0.02	0.25	0.26	0.02	0.07	0.09	—	975	975	0.06	0.15	2.00	1,024
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.21	0.20	0.18	1.83	0.00	0.00	0.28	0.28	0.00	0.07	0.07	—	290	290	0.02	0.01	0.03	294
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	19.7	19.7	< 0.005	< 0.005	< 0.005	20.6
Hauling	0.08	0.02	1.31	0.47	0.01	0.02	0.25	0.26	0.02	0.07	0.09	—	975	975	0.06	0.15	0.05	1,023

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.03	0.37	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	61.4	61.4	< 0.005	< 0.005	0.12	62.4
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.16	4.16	< 0.005	< 0.005	< 0.005	4.35
Hauling	0.02	< 0.005	0.27	0.10	< 0.005	< 0.005	0.05	0.06	< 0.005	0.01	0.02	—	206	206	0.01	0.03	0.18	216
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.2	10.2	< 0.005	< 0.005	0.02	10.3
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.69	0.69	< 0.005	< 0.005	< 0.005	0.72
Hauling	< 0.005	< 0.005	0.05	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	34.1	34.1	< 0.005	0.01	0.03	35.7

3.5. Linear, Drainage, Utilities, & Sub-Grade (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.25	1.88	17.2	19.9	0.04	0.69	—	0.69	0.64	—	0.64	—	4,090	4,090	0.17	0.03	—	4,104
Dust From Material Movement	—	—	—	—	—	—	0.62	0.62	—	0.07	0.07	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.42	0.35	3.20	3.71	0.01	0.13	—	0.13	0.12	—	0.12	—	762	762	0.03	0.01	—	765

Dust From Material Movement	—	—	—	—	—	—	0.12	0.12	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.06	0.58	0.68	< 0.005	0.02	—	0.02	0.02	—	0.02	—	126	126	0.01	< 0.005	—	127
Dust From Material Movement	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.14	0.10	1.36	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	217	217	0.01	0.01	0.90	221
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.23	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	38.3	38.3	< 0.005	< 0.005	0.07	38.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.33	6.33	< 0.005	< 0.005	0.01	6.44
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Linear, Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.02	0.86	7.92	11.7	0.02	0.34	—	0.34	0.31	—	0.31	—	1,769	1,769	0.07	0.01	—	1,775
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.63	0.93	< 0.005	0.03	—	0.03	0.02	—	0.02	—	141	141	0.01	< 0.005	—	141
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.11	0.17	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	23.3	23.3	< 0.005	< 0.005	—	23.3
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.11	0.07	1.02	0.00	0.00	0.15	0.15	0.00	0.04	0.04	—	163	163	0.01	0.01	0.67	166

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.2	12.2	< 0.005	< 0.005	0.02	12.4
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.03	2.03	< 0.005	< 0.005	< 0.005	2.06
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Remove	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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 Week	Work Days per Phase	Phase Description
Linear, Grubbing & Land Clearing	Linear, Grubbing & Land Clearing	1/1/2025	1/27/2025	5.00	19.0	—
Linear, Grading & Excavation	Linear, Grading & Excavation	1/28/2025	5/15/2025	5.00	77.0	—
Linear, Drainage, Utilities, & Sub-Grade	Linear, Drainage, Utilities, & Sub-Grade	5/16/2025	8/19/2025	5.00	68.0	—
Linear, Paving	Linear, Paving	8/20/2025	9/29/2025	5.00	29.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Linear, Grubbing & Land Clearing	Crawler Tractors	Diesel	Average	1.00	8.00	87.0	0.43
Linear, Grubbing & Land Clearing	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Linear, Grubbing & Land Clearing	Signal Boards	Electric	Average	2.00	8.00	6.00	0.82
Linear, Grading & Excavation	Crawler Tractors	Diesel	Average	1.00	8.00	87.0	0.43
Linear, Grading & Excavation	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Linear, Grading & Excavation	Graders	Diesel	Average	2.00	8.00	148	0.41
Linear, Grading & Excavation	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Linear, Grading & Excavation	Rubber Tired Loaders	Diesel	Average	1.00	8.00	150	0.36
Linear, Grading & Excavation	Scrapers	Diesel	Average	2.00	8.00	423	0.48

Linear, Grading & Excavation	Signal Boards	Electric	Average	2.00	8.00	6.00	0.82
Linear, Grading & Excavation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Linear, Drainage, Utilities, & Sub-Grade	Air Compressors	Diesel	Average	1.00	8.00	37.0	0.48
Linear, Drainage, Utilities, & Sub-Grade	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Linear, Drainage, Utilities, & Sub-Grade	Graders	Diesel	Average	1.00	8.00	148	0.41
Linear, Drainage, Utilities, & Sub-Grade	Plate Compactors	Diesel	Average	1.00	8.00	8.00	0.43
Linear, Drainage, Utilities, & Sub-Grade	Pumps	Diesel	Average	1.00	8.00	11.0	0.74
Linear, Drainage, Utilities, & Sub-Grade	Rough Terrain Forklifts	Diesel	Average	1.00	8.00	96.0	0.40
Linear, Drainage, Utilities, & Sub-Grade	Scrapers	Diesel	Average	1.00	8.00	423	0.48
Linear, Drainage, Utilities, & Sub-Grade	Signal Boards	Electric	Average	2.00	8.00	6.00	0.82
Linear, Drainage, Utilities, & Sub-Grade	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Linear, Paving	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Linear, Paving	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Linear, Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Linear, Paving	Signal Boards	Electric	Average	2.00	8.00	6.00	0.82
Linear, Paving	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Linear, Grubbing & Land Clearing	—	—	—	—
Linear, Grubbing & Land Clearing	Worker	12.5	9.47	LDA,LDT1,LDT2
Linear, Grubbing & Land Clearing	Vendor	0.00	6.03	HHDT,MHDT
Linear, Grubbing & Land Clearing	Hauling	0.00	20.0	HHDT
Linear, Grubbing & Land Clearing	Onsite truck	—	—	HHDT
Linear, Grading & Excavation	—	—	—	—
Linear, Grading & Excavation	Worker	42.5	9.47	LDA,LDT1,LDT2
Linear, Grading & Excavation	Vendor	1.00	6.03	HHDT,MHDT
Linear, Grading & Excavation	Hauling	13.6	20.0	HHDT
Linear, Grading & Excavation	Onsite truck	—	—	HHDT
Linear, Drainage, Utilities, & Sub-Grade	—	—	—	—
Linear, Drainage, Utilities, & Sub-Grade	Worker	30.0	9.47	LDA,LDT1,LDT2
Linear, Drainage, Utilities, & Sub-Grade	Vendor	0.00	6.03	HHDT,MHDT
Linear, Drainage, Utilities, & Sub-Grade	Hauling	0.00	20.0	HHDT
Linear, Drainage, Utilities, & Sub-Grade	Onsite truck	—	—	HHDT
Linear, Paving	—	—	—	—
Linear, Paving	Worker	22.5	9.47	LDA,LDT1,LDT2
Linear, Paving	Vendor	0.00	6.03	HHDT,MHDT
Linear, Paving	Hauling	0.00	20.0	HHDT
Linear, Paving	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Linear, Grubbing & Land Clearing	—	—	1.80	0.00	—
Linear, Grading & Excavation	4,200	4,200	1.80	0.00	—
Linear, Drainage, Utilities, & Sub-Grade	—	—	1.80	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Road Widening	1.80	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2025	235	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. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	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 Location	Unit
Temperature and Extreme Heat	6.20	annual days of extreme heat
Extreme Precipitation	4.85	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	39.4	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 (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth 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 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.
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 Score	Adaptive Capacity Score	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	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	0	0	0	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 Score	Adaptive Capacity Score	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	1	1	1	2
Wildfire	1	1	1	2

Flooding	N/A	N/A	N/A	N/A
Drought	1	1	1	2
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	10.6
AQ-PM	2.51
AQ-DPM	40.3
Drinking Water	38.7
Lead Risk Housing	50.2
Pesticides	0.00
Toxic Releases	0.29
Traffic	1.25
Effect Indicators	—
CleanUp Sites	31.2
Groundwater	30.9

Haz Waste Facilities/Generators	19.2
Impaired Water Bodies	0.00
Solid Waste	0.00
Sensitive Population	—
Asthma	23.7
Cardio-vascular	6.17
Low Birth Weights	—
Socioeconomic Factor Indicators	—
Education	12.6
Housing	46.5
Linguistic	0.00
Poverty	9.27
Unemployment	0.01

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	61.17028102
Employed	10.49659951
Median HI	51.53342743
Education	—
Bachelor's or higher	85.53830361
High school enrollment	100
Preschool enrollment	17.00243809
Transportation	—
Auto Access	65.16104196

Active commuting	10.8045682
Social	—
2-parent households	43.41075324
Voting	93.69947389
Neighborhood	—
Alcohol availability	60.95213653
Park access	81.35506224
Retail density	13.85859104
Supermarket access	68.74117798
Tree canopy	96.26587964
Housing	—
Homeownership	69.69074811
Housing habitability	35.28807905
Low-inc homeowner severe housing cost burden	8.558963172
Low-inc renter severe housing cost burden	14.69267291
Uncrowded housing	96.93314513
Health Outcomes	—
Insured adults	29.71897857
Arthritis	0.0
Asthma ER Admissions	98.0
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	98.1

Cognitively Disabled	54.2
Physically Disabled	33.4
Heart Attack ER Admissions	98.2
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	93.9
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	23.1
SLR Inundation Area	73.2
Children	81.0
Elderly	0.8
English Speaking	98.1
Foreign-born	2.2
Outdoor Workers	21.7
Climate Change Adaptive Capacity	—
Impervious Surface Cover	91.0
Traffic Density	9.3
Traffic Access	0.0
Other Indices	—
Hardship	29.4

Other Decision Support	—
2016 Voting	91.4

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	1.00
Healthy Places Index Score for Project Location (b)	56.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	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

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: On-Road Fugitive Dust	100% paved road; CalEEMod assumes 55% paved roads in MBARD. However, project construction would occur fully on paved roads, therefore this value was modified

Appendix B

Biological Resources Tables

Special-Status Plant and Lichen Species in the Regional Vicinity of the Project Site

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Agrostis lacuna-vernalis vernal pool bent grass	None/None G1/S1 1B.1	Annual herb. Vernal pools. In mima mound areas or on the margins of vernal pools. Elevations: 375-475ft. (115-145m.) Blooms Apr-May.	Not Expected	No natural vegetation communities or vernal pools occur within the project area.
Allium hickmanii Hickman's onion	None/None G2/S2 1B.2	Perennial bulbiferous herb. Chaparral, closed-cone coniferous forest, coastal prairie, coastal scrub, valley and foothill grassland. Sandy loam, damp ground and vernal swales; mostly in grassland though can be associated with chaparral or woodland. Elevations: 15-655ft. (5-200m.) Blooms Mar-May.	Not Expected	No natural vegetation communities or vernal swales occur within the project area.
Arctostaphylos edmundsii Little Sur manzanita	None/None G2/S2 1B.2	Perennial evergreen shrub. Chaparral, coastal bluff scrub. Sandy. Elevations: 35-345ft. (10-105m.) Blooms (May)Nov-Apr.	Not Expected	No natural vegetation communities occur within the project area, and no manzanita were observed.
Arctostaphylos hookeri ssp. *hookeri* Hooker's manzanita	None/None G3T2/S2 1B.2	Perennial evergreen shrub. Chaparral, cismontane woodland, Closed-cone coniferous forest, coastal scrub. Sandy. Elevations: 195-1760ft. (60-536m.) Blooms Jan-Jun.	Not Expected	No natural vegetation communities occur within the project area, and no manzanita were observed.
Arctostaphylos montereyensis Toro manzanita	None/None G2?/S2? 1B.2	Perennial evergreen shrub. Chaparral, cismontane woodland, coastal scrub. Sandy. Elevations: 100-2395ft. (30-730m.) Blooms Feb-Mar.	Not Expected	No natural vegetation communities occur within the project area, and no manzanita were observed.
Arctostaphylos pajaroensis Pajaro manzanita	None/None G1/S1 1B.1	Perennial evergreen shrub. Chaparral. Sandy soils. Elevations: 100-2495ft. (30-760m.) Blooms Dec-Mar.	Not Expected	No natural vegetation communities occur within the project area, and no manzanita were observed.
Arctostaphylos pumila sandmat manzanita	None/None G1/S1 1B.2	Perennial evergreen shrub. Chaparral, cismontane woodland, Closed-cone coniferous forest, coastal dunes, coastal scrub. Openings, sandy. Elevations: 10-675ft. (3-205m.) Blooms Feb-May.	Not Expected	No natural vegetation communities occur within the project area, and no manzanita were observed.
Astragalus tener var. *titi* coastal dunes milk-vetch	FE/SE G2T1/S1 1B.1	Annual herb. Coastal bluff scrub, coastal dunes, coastal prairie. Moist, sandy depressions of bluffs or dunes along and near the Pacific Ocean; one site on a clay terrace. Elevations: 5-165ft. (1-50m.) Blooms Mar-May.	Not Expected	No natural vegetation communities or coastal dunes occur within the project area.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Castilleja ambigua var. *insalutata* pink Johnny-nip	None/None G4T2/S2 1B.1	Annual herb (hemiparasitic). Coastal prairie, coastal scrub. Wet or moist coastal strand or scrub habitats. Elevations: 0-330ft. (0-100m.) Blooms May-Aug.	Not Expected	No natural vegetation communities or coastal dune habitats occur within the project area.
Centromadia parryi ssp. *congdonii* Congdon's tarplant	None/None G3T2/S2 1B.1	Annual herb. Valley and foothill grassland. Alkaline soils, sometimes described as heavy white clay. Elevations: 0-755ft. (0-230m.) Blooms May-Oct(Nov).	Not Expected	No natural vegetation communities with clay soils occur within the project area.
Chorizanthe minutiflora Fort Ord spineflower	None/None G1/S1 1B.2	Annual herb. Chaparral, coastal scrub. Sandy, openings. Openings, sandy. Elevations: 180-490ft. (55-150m.) Blooms Apr-Jul.	Not Expected	No natural vegetation communities or coastal scrub habitats occur within the project area.
Chorizanthe pungens var. *pungens* Monterey spineflower	FT/None G2T2/S2 1B.2	Annual herb. Chaparral, cismontane woodland, coastal dunes, coastal scrub, valley and foothill grassland. Sandy soils in coastal dunes or more inland within chaparral or other habitats. Elevations: 10-1475ft. (3-450m.) Blooms Apr-Jun(Jul-Aug).	Not Expected	No natural vegetation communities or coastal dune habitats occur within the project area.
Clarkia jolonensis Jolon clarkia	None/None G2/S2 1B.2	Annual herb. Chaparral, cismontane woodland, coastal scrub, riparian woodland. Elevations: 65-2165ft. (20-660m.) Blooms Apr-Jun.	Not Expected	No natural vegetation communities or coastal scrub habitats occur within the project area.
Collinsia multicolor San Francisco collinsia	None/None G2/S2 1B.2	Annual herb. Blooms March-May. Closed-cone coniferous forest, coastal scrub. On decomposed shale (mudstone) mixed with humus. 30-250m (Serpentinite (sometimes). Elevations: 100-820ft).900ft. (30-275m.) Blooms (Feb)Mar-May.	Not Expected	No natural vegetation communities with serpentine soils occur within the project area.
Cordylanthus rigidus ssp. *littoralis* seaside bird's-beak	None/SE G5T2/S2 1B.1	Annual herb (hemiparasitic). Chaparral, cismontane woodland, Closed-cone coniferous forest, coastal dunes, coastal scrub. Sandy, Disturbed areas (often disturbed sites, usually within chaparral or coastal scrub.), sandy. Elevations: 0-1690ft. (0-515m.) Blooms Apr-Oct.	Not Expected	No natural vegetation communities or chaparral habitats occur within the project area.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Delphinium californicum ssp. *interius* Hospital Canyon larkspur	None/None G3T3/S3 1B.2	Perennial herb. Chaparral, cismontane woodland, coastal scrub. In wet, boggy meadows, openings in chaparral and in canyons. Elevations: 640-3595ft. (195-1095m.) Blooms Apr-Jun.	Not Expected	No natural vegetation communities or wet meadow or woodland habitats occur within the project area.
Delphinium hutchinsoniae Hutchinson's larkspur	None/None G2/S2 1B.2	Perennial herb. Broadleafed upland forest, Chaparral, coastal chaparral, coastal prairie, coastal scrub. On semi-shaded, slightly moist slopes, usually west-facing. Elevations: 0-1400ft. (0-427m.) Blooms Mar-Jun.	Not Expected	No natural vegetation communities or forest habitats occur within the project area.
Ericameria fasciculata Eastwood's goldenbush	None/None G2/S2 1B.1	Perennial evergreen shrub. Chaparral, Closed-cone coniferous forest, coastal dunes, coastal scrub. In sandy openings. Elevations: 100-900ft. (30-275m.) Blooms Jul-Oct.	Not Expected	No natural vegetation communities or coastal habitats occur within the project area.
Eriogonum nortonii Pinnacles buckwheat	None/None G2/S2 1B.3	Annual herb. Chaparral, valley and foothill grassland. Sandy soils; often on recent burns; western Santa Lucias. Elevations: 985-3200ft. (300-975m.) Blooms (Apr)Aug(Sep)May-Jun.	Not Expected	No natural vegetation communities or grassland habitats occur within the project area.
Erysimum ammophilum sand-loving wallflower	None/None G2/S2 1B.2	Perennial herb. Chaparral, coastal dunes, coastal scrub. Sandy openings. Elevations: 0-195ft. (0-60m.) Blooms Feb-Jun(Jul-Aug).	Not Expected	No natural vegetation communities or coastal dune habitats occur within the project area.
Erysimum menziesii Menzies' wallflower	FE/SE G1/S1 1B.1	Bloom period: January-August. Occurs in coastal perennial herb. Coastal dunes, headlands, and cliffs. Localized on dunes and coastal strand. Elevations: 1-25 meters. 0-115ft. (0-35m.) Blooms Mar-Sep.	Not Expected	No natural vegetation communities or coastal dune habitats occur within the project area.
Fritillaria liliacea fragrant fritillary	None/None G2/S2 1B.2	Perennial bulbiferous herb. Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland. Often on serpentine; various soils reported though usually on clay, in grassland. Elevations: 10-1345ft. (3-410m.) Blooms Feb-Apr.	Not Expected	No natural vegetation communities or coastal habitats with serpentine soils occur within the project area.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Gilia tenuiflora ssp. *arenaria* Monterey gilia	FE/ST G3G4T2/S2 1B.2	Annual herb. Chaparral, cismontane woodland, coastal dunes, coastal scrub. Sandy openings in bare, wind-sheltered areas. Often near dune summit or in the hind dunes; two records from Pleistocene inland dunes. Elevations: 0-150ft. (0-45m.) Blooms Apr-Jun.	Not Expected	No natural vegetation communities or coastal dune habitats occur within the project area.
Hesperocyparis goveniana Gowen cypress	FT/None G1/S1 1B.2	Perennial evergreen tree. Chaparral, closed-cone coniferous forest. Coastal terraces; usually in sandy soils; sometimes with Monterey pine, bishop pine. Elevations: 100-985ft. (30-300m.)	Not Expected	No natural vegetation communities or forest habitats occur within the project area.
Hesperocyparis macrocarpa Monterey cypress	None/None G1/S1 1B.2	Perennial evergreen tree. Closed-cone coniferous forest. Granitic soils. Elevations: 35-100ft. (10-30m.)	Present	This species was identified in the project area; however, these individuals are ornamental plantings, or the result of naturalized ornamental plantings.
Horkelia cuneata var. *sericea* Kellogg's horkelia	None/None G4T1?/S1? 1B.1	Perennial herb. Chaparral, closed-cone coniferous forest, coastal dunes, coastal scrub. Old dunes, coastal sandhills; openings. Sandy or gravelly soils. Elevations: 35-655ft. (10-200m.) Blooms Apr-Sep.	Not Expected	No natural vegetation communities or coastal dune habitats occur within the project area.
Horkelia marinensis Point Reyes horkelia	None/None G2/S2 1B.2	Perennial herb. Coastal dunes, coastal prairie, coastal scrub. Sandy flats and dunes near coast; in grassland or scrub plant communities. Elevations: 15-2475ft. (5-755m.) Blooms May-Sep.	Not Expected	No natural vegetation communities or coastal dune habitats occur within the project area.
Lasthenia conjugens Contra Costa goldfields	FE/None G1/S1 1B.1	Annual herb. Cismontane woodland, playas, valley and foothill grassland, vernal pools. Vernal pools, swales, low depressions, in open grassy areas. Elevations: 0-1540ft. (0-470m.) Blooms Mar-Jun.	Not Expected	No natural vegetation communities or vernal pool habitats occur within the project area.
Layia carnosa beach layia	FT/SE G2/S2 1B.1	Annual herb. Coastal dunes, coastal scrub. On sparsely vegetated, semi-stabilized dunes, usually behind foredunes. Elevations: 0-195ft. (0-60m.) Blooms Mar-Jul.	Not Expected	No natural vegetation communities or coastal dune habitats occur within the project area.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Lupinus tidestromii Tidestrom's lupine	FE/SE G1/S1 1B.1	Perennial rhizomatous herb. Coastal dunes. Partially stabilized dunes, immediately near the ocean. Elevations: 0-330ft. (0-100m.) Blooms Apr-Jun.	Not Expected	No natural vegetation communities or coastal dune habitats occur within the project area.
Malacothamnus palmeri var. *involucratus* Carmel Valley bush-mallow	None/None G3T2Q/S2 1B.2	Perennial deciduous shrub. Chaparral, cismontane woodland, coastal scrub. Talus hilltops and slopes, sometimes on serpentine. Fire dependent. Elevations: 100-3610ft. (30-1100m.) Blooms Apr-Oct.	Not Expected	No natural vegetation communities or coastal scrub habitats occur within the project area.
Malacothrix saxatilis var. *arachnoidea* Carmel Valley malacothrix	None/None G5T2/S2 1B.2	Perennial rhizomatous herb. Chaparral, coastal scrub. Rock outcrops or steep rocky roadcuts. Elevations: 80-3400ft. (25-1036m.) Blooms (Mar)Jun-Dec.	Not Expected	No natural vegetation communities or coastal scrub habitats occur within the project area.
Microseris paludosa marsh microseris	None/None G2/S2 1B.2	Perennial herb. Cismontane woodland, closed-cone coniferous forest, coastal scrub, valley and foothill grassland. Elevations: 15-1165ft. (5-355m.) Blooms Apr-Jun(Jul).	Not Expected	No natural vegetation communities or coastal scrub habitats occur within the project area.
Monardella sinuata ssp. *nigrescens* northern curly-leaved monardella	None/None G3T2/S2 1B.2	Annual herb. Chaparral, coastal dunes, coastal scrub, lower montane coniferous forest. Sandy soils. Elevations: 0-985ft. (0-300m.) Blooms (Apr)May-Jul(Aug-Sep).	Not Expected	No natural vegetation communities or coastal scrub habitats occur within the project area.
Monolopia gracilens woodland woollythreads	None/None G3/S3 1B.2	Annual herb. Broadleafed upland forest, chaparral, cismontane woodland, north coast coniferous forest, valley and foothill grassland. Grassy sites, in openings; sandy to rocky soils. Often seen on serpentine after burns, but may have only weak affinity to serpentine. Elevations: 330-3935ft. (100-1200m.) Blooms (Feb)Mar-Jul.	Not Expected	No natural vegetation communities with serpentine soils occur within the project area.
Pinus radiata Monterey pine	None/None G1/S1 1B.1	Perennial evergreen tree. Cismontane woodland, closed-cone coniferous forest. Dry bluffs and slopes. Elevations: 80-605ft. (25-185m.)	Present	This species was identified in the project area; however, these individuals are ornamental plantings, or the result of naturalized ornamental plantings.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Piperia yadonii Yadon's rein orchid	FE/None G1/S1 1B.1	Perennial herb. Chaparral, closed-cone coniferous forest, coastal bluff scrub. On sandstone and sandy soil, but poorly drained and often dry. Elevations: 35-1675ft. (10-510m.) Blooms (Feb)May-Aug.	Not Expected	No natural vegetation communities or coastal scrub habitats occur within the project area.
Plagiobothrys uncinatus hooked popcornflower	None/None G2/S2 1B.2	Annual herb. Chaparral, cismontane woodland, valley and foothill grassland. Sandstone outcrops and canyon sides; often in burned or disturbed areas. Elevations: 985-2495ft. (300-760m.) Blooms Apr-May.	Not Expected	No natural vegetation communities with sandstone outcrops occur within the project area.
Potentilla hickmanii Hickman's cinquefoil	FE/SE G1/S1 1B.1	Perennial herb. Closed-cone coniferous forest, coastal bluff scrub, marshes and swamps, meadows and seeps. Freshwater marshes, seeps, and small streams in open or forested areas along the coast. Elevations: 35-490ft. (10-149m.) Blooms Apr-Aug.	Not Expected	No natural vegetation communities or coastal scrub habitats occur within the project area.
Ramalina thrausta angel's hair lichen	None/None G5?/S2S3 2B.1	Fruticose lichen (epiphytic). North coast coniferous forest. On dead twigs and other lichens. Elevations: 245-1410ft. (75-430m.)	Low Potential	Coniferous plants are present, and lichens are know to occur in the project vicinity.
Rosa pinetorum pine rose	None/None G2/S2 1B.2	Perennial shrub. Cismontane woodland, closed-cone coniferous forest. Elevations: 5-3100ft. (2-945m.) Blooms May-Jul.	Not Expected	No natural vegetation communities or woodland habitats occur within the project area.
Stebbinsoseris decipiens Santa Cruz microseris	None/None G2/S2 1B.2	Annual herb. Broadleafed upland forest, chaparral, closed-cone coniferous forest, coastal prairie, coastal scrub, valley and foothill grassland. Open areas in loose or disturbed soil, usually derived from sandstone, shale or serpentine, on seaward slopes. Elevations: 35-1640ft. (10-500m.) Blooms Apr-May.	Not Expected	No natural vegetation communities or coastal scrub habitats occur within the project area.
Sulcaria spiralifera twisted horsehair lichen	None/None G3G4/S2 1B.2	Fruticose lichen (epiphytic). Coastal dunes, north coast coniferous forest. Usually on conifers. Elevations: 0-295ft. (0-90m.)	Low Potential	Coniferous plants are present, and lichens are know to occur in the project vicinity.
Tortula californica California screw moss	None/None G2G3/S2? 1B.2	Moss. Chenopod scrub, valley and foothill grassland. Moss growing on sandy soil. Elevations: 35-4790ft. (10-1460m.)	Low Potential	Coniferous plants are present, and lichens are know to occur in the project vicinity.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Trifolium buckwestiorum Santa Cruz clover	None/None G2/S2 1B.1	Annual herb. Broadleafed upland forest, cismontane woodland, coastal prairie. Moist grassland. Gravelly margins. Elevations: 345-2000ft. (105-610m.) Blooms Apr-Oct.	Not Expected	No natural vegetation communities or woodland habitats occur within the project area.
Trifolium hydrophilum saline clover	None/None G2/S2 1B.2	Annual herb. Marshes and swamps, valley and foothill grassland, vernal pools. Mesic, alkaline sites. Elevations: 0-985ft. (0-300m.) Blooms Apr-Jun.	Not Expected	No natural vegetation communities or marsh habitats with alkaline soils occur within the project area.
Trifolium polyodon Pacific Grove clover	None/SR G1/S1 1B.1	Annual herb. Closed-cone coniferous forest, coastal prairie, meadows and seeps, valley and foothill grassland. Along small springs and seeps in grassy openings. Elevations: 15-1395ft. (5-425m.) Blooms Apr-Jun(Jul).	Not Expected	No natural vegetation communities or forest habitats occur within the project area.
Trifolium trichocalyx Monterey clover	FE/SE G1/S1 1B.1	Annual herb. Closed-cone coniferous forest. Openings, burned areas, and roadsides. Sandy soils. Elevations: 100-1000ft. (30-305m.) Blooms Apr-Jun.	Not Expected	No natural vegetation communities or forest habitats occur within the project area.

ft. = feet; m. = meter

Regional Vicinity refers to within a nine-quad search radius of site (in this case, a five-quad search was conducted due to the proximity of the Pacific Ocean).

Status (Federal/State)

FE = Federal Endangered
FT = Federal Threatened
SE = State Endangered
ST = State Threatened
SR = State Rare

CRPR (California Native Plant Society California Rare Plant Rank)

1B = Rare, Threatened, or Endangered in California and elsewhere
2B= Rare, Threatened, or Endangered in California, but more common elsewhere

CRPR Threat Code Extension

.1 = Seriously endangered in California (>80% of occurrences threatened/high degree and immediacy of threat)
.2 = Moderately threatened in California (20-80% of occurrences threatened/moderate degree and immediacy of threat)
.3 = Not very endangered in California (<20% of occurrences threatened/low degree and immediacy of threat)

Other Statuses

G1 or S1 Critically Imperiled Globally or Subnationally (state)
G2 or S2 Imperiled Globally or Subnationally (state)
G3 or S3 Vulnerable to extirpation or extinction Globally or Subnationally (state)
G4/5 or S4/5 Apparently secure, common and abundant

Additional notations may be provided as follows

T – Intraspecific Taxon (subspecies, varieties, and other designations below the level of species)
Q – Questionable taxonomy that may reduce conservation priority
? – Inexact numeric rank

Special Status Animal Species in the Regional Vicinity of the Project Site

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Invertebrates				
Bombus caliginosus obscure bumble bee	None/None G2G3/S1S2	Coastal areas from Santa Barbara County north to Washington state. Food plant genera include Baccharis, Cirsium, Lupinus, Lotus, Grindelia and Phacelia.	Low Potential	Flowering plants are present; however no beehives or suitable burrows were observed.
Bombus occidentalis western bumble bee	None/SCE G3/S1	Once common and widespread, species has declined precipitously from central CA to southern B.C., perhaps from disease. .	Low Potential	There are two known CNDDB occurrences within five miles, lowering plants are present; however no beehives or suitable burrows were observed.
Danaus plexippus pop. 1 monarch - California overwintering population	FC/None G4T1T2Q/S2	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	Not Expected	There are nine known CNDDB occurrences within five miles, however the site does not contain suitable wintering habitat.
Euphilotes enoptes smithi Smith's blue butterfly	FE/None G5T2/S2	Most commonly associated with coastal dunes & coastal sage scrub plant communities in Monterey & Santa Cruz counties. Hostplant: *Eriogonum latifolium* and *Eriogonum parvifolium* are utilized as both larval and adult foodplants.	Not Expected	There are 10 known CNDDB occurrences within five miles, however no coastal sage brush habitat is present.
Fish				
Eucyclogobius newberryi tidewater goby	FE/None G3/S3	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	Not Expected	There are no known CNDDB occurrences within five miles and suitable brackish water habitat not present.
Lavinia exilicauda harengus Monterey hitch	None/None G4T3/S3 SSC		Not Expected	There are no known CNDDB occurrences within five miles, and the site does not contain aquatic habitats.
Oncorhynchus mykiss irideus pop. 9 steelhead - south-central California coast DPS	FT/None G5T2Q/S2	Federal listing refers to runs in coastal basins from the Pajaro River south to, but not including, the Santa Maria River.	Not Expected	There is one known CNDDB occurrence within five miles from the Carmel River. However, no suitable habitat present.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Amphibians				
Ambystoma californiense Pop 1. California tiger salamander - central California DPS	FT/ST G2G3T3/S3 CDFW_WL	Lives in vacant or mammal-occupied burrows throughout most of the year; in grassland, savanna, or open woodland habitats. Need underground refuges, especially ground squirrel burrows, and vernal pools or other seasonal water sources for breeding.	Not Expected	There are five known CNDDB occurrences within five miles, however suitable open habitats are not present, and the site is largely isolated by development.
Rana boylii pop. 6 foothill yellow-legged frog - south coast DPS	FPE/SE G3T1/S1	Southern Coast Ranges from Monterey Bay south through San Gabriel Mountains; west of the Salinas River in Monterey Co, south through Transverse Ranges, and east through San Gabriel Mountains. Historically may have ranged to Baja California. Partly shaded shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying and at least 15 weeks to attain metamorphosis.	Not Expected	There are four known CNDDB occurrences within five miles, including one occurrence within the Carmel River. However, this occurrence is from 1904 and is possibly extirpated, and suitable aquatic habitat is not present.
Rana draytonii California red-legged frog	FT/None G2G3/S2S3 CDFW_SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	Moderate Potential	There are 14 known CNDDB occurrences within five miles, including numerous sightings in the Carmel River south of the southern staging area.
Taricha torosa Coast Range newt	None/None G4/S4 CDFW_SSC	Coastal drainages from Mendocino County to San Diego County. Lives in terrestrial habitats & will migrate over 1 km to breed in ponds, reservoirs & slow moving streams.	Not Expected	There are two known CNDDB occurrences within five miles and the Carmel River provides suitable habitat.
Reptiles				
Anniella pulchra northern California legless lizard	None/None G3/S2S3 CDFW_SSC	Sandy or loose loamy soils under sparse vegetation. Soil moisture is essential. They prefer soils with a high moisture content.	Not Expected	There are no known CNDDB occurrences within five miles, and suitable natural habitat with sandy soils is not present.
Emys marmorata western pond turtle	None/None G3G4/S3	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation. Needs basking sites and suitable	Not Expected	There are tree known CNDDB occurrences within five miles, including sightings in the Carmel River, however

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
	CDFW_SSC	(sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.		ponds are not present and the site is largely isolated by development.
Phrynosoma blainvillii coast horned lizard	None/None G4/S4 CDFW_SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Not Expected	There are no known CNDDB occurrences within five miles, and the site does not contain suitable open sandy areas.
Birds				
Agelaius tricolor tricolored blackbird	None/ST G1G2/S2 CDFW_SSC	Highly colonial species, most numerous in Central Valley & vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	Not Expected	There are no known CNDDB occurrences within five miles, and emergent vegetation is not present.
Athene cunicularia burrowing owl	None/None G4/S2 CDFW_SSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Not Expected	There is one known CNDDB occurrence within five miles, however no known occurrences within the Carmel Valley, and the site is largely developed or landscaped.
Buteo regalis ferruginous hawk	None/None G4/S3S4 WL	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats. Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.	Not Expected	There are no known CNDDB occurrences within five miles and the study area does not provide suitable breeding or wintering habitat.
Charadrius nivosus nivosus western snowy plover	FT/None G3T3/S3 CDFW_SSC	Sandy beaches, salt pond levees & shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	Not Expected	There is one known CNDDB occurrence within five miles, however suitable breeding habitat is not present.
Coturnicops noveboracensis yellow rail	None/None G4/S2 CDFW_SSC	Summer resident in eastern Sierra Nevada in Mono County. Freshwater marshlands.	Not Expected	There is one known CNDDB occurrence within five miles, however marshes are not present.
Cypseloides niger black swift	None/None G4/S2	Coastal belt of Santa Cruz and Monterey counties; central & southern Sierra Nevada; San Bernardino & San Jacinto mountains. Breeds in	Not Expected	There is one known CNDDB occurrence within five miles, however cliff breeding habitats are not present.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
	CDFW_SSC	small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above the surf; forages widely.		
Laterallus jamaicensis coturniculus California black rail	None/ST G3G4T1/S1 CDFW_FP	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.	Not Expected	There is one known CNDDB occurrence within five miles, however marshes are not present.
Oceanodroma homochroa ashy storm-petrel	None/None G2/S2 CDFW_SSC	Colonial nester on off-shore islands. Usually nests on driest part of islands. Forages over open ocean. Nest sites on islands are in crevices beneath loosely piled rocks or driftwood, or in caves.	Not Expected	There are no known CNDDB occurrences within five miles and suitable breeding habitats are not present.
Pelecanus occidentalis californicus California brown pelican	FD/SD G4T3T4/S3 CDFW_FP	Colonial nester on coastal islands just outside the surf line. Nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators. Roosts communally.	Not Expected	There are two known CNDDB occurrences within five miles, however suitable breeding habitats are not present.
Riparia riparia bank swallow	None/ST G5/S2	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	Not Expected	There are no known CNDDB occurrences within five miles and suitable breeding habitats are not present.
Mammals				
Corynorhinus townsendii Townsend's big-eared bat	None/None G3G4/S2 CDFW_SSC	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	Not Expected	There is one known occurrence within five miles, however suitable day roost sites are not present.
Eumetopias jubatus Steller (=northern) sea-lion	FD/None G3/S2	Breeds on Ano Nuevo, San Miguel and Farallon islands, Point St. George, and Sugarloaf. Hauls-out on islands and rocks. Needs haul-out and breeding sites with unrestricted access to water, near aquatic food supply and with no human disturbance.	Not Expected	There are two known CNDDB occurrences within five miles, however suitable marine habitats are not present.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Sorex ornatus salarius Monterey shrew	None/None G5T1T2/S1S2 CDFW_SSC	Riparian, wetland & upland areas in the vicinity of the Salinas River delta. Prefers moist microhabitats. feeds on insects & other invertebrates found under logs, rocks & litter.	Not Expected	There are four known CNDDB occurrences within five miles, however suitable riparian habitat is not present and there are no known occurrences from Carmel Valley.
Taxidea taxus American badger	None/None G5/S3 CDFW_SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Not Expected	There are no known CNDDB occurrences within five miles and suitable open habitat is not present.

Regional Vicinity refers to within a nine-quad search radius of site (in this case, a five-quad search was conducted due to the proximity of the Pacific Ocean).

Status (Federal/State)

FE = Federal Endangered
FT = Federal Threatened
FPE = Federal Proposed Endangered
FD = Federal Delisted
FC = Federal Candidate
SE = State Endangered
ST = State Threatened
SCE = State Candidate Endangered
SD = State Delisted
SSC = CDFW Species of Special Concern
FP = CDFW Fully Protected
WL = CDFW Watch List

Other Statuses

G1 or S1 Critically Imperiled Globally or Subnationally (state)
G2 or S2 Imperiled Globally or Subnationally (state)
G3 or S3 Vulnerable to extirpation or extinction Globally or Subnationally (state)
G4/5 or S4/5 Apparently secure, common and abundant

Additional notations may be provided as follows

T – Intraspecific Taxon (subspecies, varieties, and other designations below the level of species)
Q – Questionable taxonomy that may reduce conservation priority

Appendix C

Energy Calculation Sheets

CAWD Scenic Road Pipeline

Last Updated: 8/29/2023

Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors **[1]**:

HP: 0 to 100	0.0588	HP: Greater than 100	0.0529

Values above are expressed in gallons per horsepower-hour/BSFC.

CONSTRUCTION EQUIPMENT

Construction Equipment	#	Hours per Day	Horsepower	Load Factor	Construction Phase	Fuel Used (gallons)
Crawler Tractors	1	8	87	0.43	Grubbing and Land Clearing	334
Excavators	2	8	36	0.38	Grubbing and Land Clearing	244
Signal Boards	2	8	6	0.82	Grubbing and Land Clearing	88
Crawler Tractors	1	8	87	0.43	Grading and Excavation	1,354
Excavators	3	8	36	0.38	Grading and Excavation	1,486
Graders	2	8	148	0.41	Grading and Excavation	3,952
Rollers	2	8	36	0.38	Grading and Excavation	990
Rubber Tired Loaders	1	8	150	0.36	Grading and Excavation	1,758
Scrapers	2	8	423	0.48	Grading and Excavation	13,222
Signal Boards	2	8	6	0.82	Grading and Excavation	356
Tractors/Loaders/Backhoes	4	8	84	0.37	Grading and Excavation	4,500
Air Compressors	1	8	37	0.48	Drainage/Utilities/Subgrade	568
Generator Sets	1	8	14	0.74	Drainage/Utilities/Subgrade	331
Graders	1	8	148	0.41	Drainage/Utilities/Subgrade	1,745
Plate Compactors	1	8	8	0.43	Drainage/Utilities/Subgrade	110
Pumps	1	8	11	0.74	Drainage/Utilities/Subgrade	260
Rough Terrain Forklifts	1	8	96	0.4	Drainage/Utilities/Subgrade	1,228
Scrapers	1	8	423	0.48	Drainage/Utilities/Subgrade	5,838
Signal Boards	2	8	6	0.82	Drainage/Utilities/Subgrade	315
Tractors/Loaders/Backhoes	3	8	84	0.37	Drainage/Utilities/Subgrade	2,981
Pavers	1	8	81	0.42	Paving	464
Paving Equipment	1	8	89	0.36	Paving	437
Rollers	2	8	36	0.38	Paving	373
Signal Boards	2	8	6	0.82	Paving	134
Tractors/Loaders/Backhoes	3	8	84	0.37	Paving	1,271
					Total Fuel Used	**44,340 (Gallons)**

Construction Phase	Days of Operation
Grubbing and Land Clearing	19
Grading and Excavation	77
Drainage/Utilities/Subgrade	68
Paving	29
Total Days	193

WORKER TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Grubbing and Land Clearing	24.1	25	9.5	186.65
Grading and Excavation	24.1	85	9.5	2571.83
Drainage/Utilities/Subgrade	24.1	60	9.5	1603.22
Paving	24.1	45	9.5	512.79
		Total		**4,874.50**

HAULING AND VENDOR TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
HAULING TRIPS				
Grubbing and Land Clearing	7.5	0	20.0	0.00
Grading and Excavation	7.5	27	20.0	72.53
Drainage/Utilities/Subgrade	7.5	0	20.0	0.00
Paving	7.5	0	20.0	0.00
			Total	**72.53**
VENDOR TRIPS				
Grubbing and Land Clearing	7.5	0	6.0	0.00
Grading and Excavation	7.5	2	6.0	123.82
Drainage/Utilities/Subgrade	7.5	0	6.0	0.00
Paving	7.5	0	6.0	0.00
			Total	**123.82**

Total Gasoline Consumption (gallons)	**4,874**
Total Diesel Consumption (gallons)	**44,536**

Sources:

[1] United States Environmental Protection Agency. 2021. *Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES3.0.2* . September. Available at: https://www.epa.gov/system/files/documents/2021-08/420r21021.pdf.

[2] United States Department of Transportation, Bureau of Transportation Statistics. 2021. *National Transportation Statistics* . Available at: https://www.bts.gov/topics/national-transportation-statistics.

Appendix D

Geotechnical Investigation

GEOTECHNICAL INVESTIGATION

SCENIC ROAD
SEWER REHABILITATION PROJECT
CARMEL AREA WASTEWATER DISTRICT
CARMEL-BY-THE-SEA, CALIFORNIA

FOR
MNS ENGINEERS, INC.
SANTA BARBARA, CALIFORNIA

Pacific Crest
ENGINEERING INC

CONSULTING GEOTECHNICAL ENGINEERS

2123-M251-A48
Revised JUNE 2022
www.4pacific-crest.com

June 10, 2022 Project No. 2123-M251-A48

Mr. Nick Panofsky
MNS Engineers, Inc.
201 N. Calle Cesar Chavez, Suite 300
Santa Barbara, CA 93103

Subject: **Geotechnical Investigation – Design Phase (Updated)**
Scenic Road Sewer Rehabilitation Project
Carmel Area Wastewater District
Carmel-by-the-Sea, California

Dear Mr. Panofsky,

In accordance with your authorization, we have performed a geotechnical investigation for the proposed new sewer main replacement project in Carmel By-The-Sea California.

This updated report has been prepared to include results and recommendations resulting from the drilling of an additional seven (7) borings to address an additional mile of pipeline replacement that has been added to the project scope. This updated report replaces our August 13, 2021 report in its entirety.

The accompanying report presents our findings, conclusions and recommendations for the subject project. If you have any questions concerning the information presented in this report, please call our office.

Very truly yours,

PACIFIC CREST ENGINEERING INC.

Elizabeth M. Mitchell, GE
Associate Geotechnical Engineer
GE 2718
Expires 12/31/22

Chris Johnson, PE
Principal Civil Engineer
CE 82630
Expires 9/30/22

TABLE OF CONTENTS

GEOTECHNICAL INVESTIGATION REPORT
Scenic Road Sewer Rehabilitation Project
Carmel Area Wastewater District
Carmel-by-the-Sea, California

I. INTRODUCTION

PURPOSE AND SCOPE

This report describes the geotechnical investigation and presents our conclusions and recommendations for Carmel Area Wastewater District's Scenic Road Sewer Rehabilitation Project, in Carmel-by-the-Sea, California.

Our scope of services for this project has consisted of:

1. Site reconnaissance to observe the existing conditions.

2. Review of the following published maps:
   - Geologic Map of the Monterey Peninsula and Vicinity, Monterey County, California, Dibblee Jr., 1999.
   - Geologic Map of Monterey and Seaside 7.5-Minute Quadrangles, Monterey County, California, Clark, Dupré, Rosenberg, 1997.
   - Map Showing Liquefaction Susceptibility of Monterey County, California, Rosenberg, 2001.
   - Monterey County GIS Geologic Hazards Map Application accessed July 2021 from Monterey County website: https://montereyco.maps.arcgis.com/apps/webappviewer/index.html?id=80aadc38518a45889751e97546ca5c53.
   - U.S. Geological Survey (and the California Geologic Survey), 2018, Quaternary fault and fold database for the United States, accessed July 2021, from USGS website: http//earthquake.usgs.gov/hazards/qfaults/.

3. The drilling and logging of fifteen (15) test borings.

4. Laboratory analysis of retrieved soil samples.

5. Engineering analysis of the field and laboratory test results.

6. Preparation of this report documenting our investigation and presenting geotechnical recommendations for the design and construction of the project.

PROJECT LOCATION

The project site area includes portions of Scenic Road, San Antonio Avenue, Camino Real, Carmelo Street, 14th Avenue and 15th Avenue, in Carmel-by-the-Sea, California. Please refer to the Regional Site Map, Figure No. 1, in Appendix A for the general vicinity of the project site, which is approximated by the following coordinates:

Latitude = 36.550068 degrees
Longitude = -121.928707 degrees

PROPOSED IMPROVEMENTS

It is our understanding that Carmel Area Wastewater District is considering replacing approximately 4,950 linear feet of 8-inch diameter vitrified clay pipe (VCP) sewer main, and approximately 30 linear feet of 6-inch steel force main. The VCP sewer main will be replaced using pipe bursting, and the steel force main will be replaced using open cut trenching. The section of sewer main to be replaced via pipe-bursting extends along Scenic Drive from its intersection with Ocean Avenue south to the existing pump station located approximately 750 feet west of Martin Way. The 30-foot section of force main is located at the intersection of San Antonio and Santa Lucia Avenue.

An additional mile of sewer main replacement is planned to be completed by open cut trenching along San Antonio Avenue between Santa Lucia and 15th, 15th Avenue from San Antonio to Camino Real, Camino Real between 15th Avenue and Santa Lucia, 14th Avenue, and Carmelo Street from 15th Avenue to Scenic Road (collectively referred to as "inland streets"). For approximate extents of these sewer main replacements, please refer to Figure 2A through Figure 2F in Appendix A.

The existing sewer mains are located approximately 5 to 18 feet below the ground surface. The width and depth of the trenches are not known.

II. INVESTIGATION METHODS

FIELD INVESTIGATION

Fifteen (15), 6-inch diameter test borings were drilled at the site on May 24, 2021 (Scenic Road), and April 20, 2022 (inland streets). The approximate locations of the test borings are shown on the Regional Site Map, Figure No. 2A through Figure 2F, in Appendix A. The drilling method used was hydraulically operated continuous flight augers on a tractor mounted drill rig. A geologist from Pacific Crest Engineering Inc. was present during the drilling operations to log the soil encountered and to choose sampler type and locations.

Relatively undisturbed soil samples were obtained at various depths by driving a split spoon sampler 18 inches into the ground. This was achieved by dropping a 140-pound hammer a vertical height of 30 inches. The hammer was actuated with a wire winch. The number of blows required to drive the sampler each 6-inch increment and the total number of blows required to drive the last 12 inches was

recorded by the field engineer. The outside diameter of the samplers used was 3, 2.5, or 2 inches and is designated on the Boring Logs as "L", "M" or "T", respectively.

The field blow counts in 6-inch increments are reported on the Boring Logs adjacent to each sample as well as the Standard Penetration Test data (SPT). All STP data has been normalized to a 2-inch O.D. sampler and is reported on the Boring Logs as SPT "N" values. The normalization method used was derived from the second edition of the Foundation Engineering Handbook (H.Y. Fang, 1991). The method utilizes a Sampler Hammer Ratio which is dependent on the weight of the hammer, height of hammer drop, outside diameter of sampler, and inside diameter of sample.

The soils encountered in the borings were continuously logged in the field and visually described in accordance with the Unified Soil Classification System (ASTM D2488) as described in the Boring Log Explanation, Figures No. 3 and 4, in Appendix A. The soil classification was verified upon completion of laboratory testing in accordance with ASTM D2487.

Appendix A contains the site plan showing the locations of the test borings, our borings logs and an explanation of the soil classification system used. Stratification lines on the boring logs are approximate as the actual transition between soil types may be gradual.

LABORATORY TESTING

The laboratory testing program was developed to aid in evaluating the engineering properties of the materials encountered at the site. Laboratory tests performed include:

- Moisture Density relationships in accordance with ASTM D2937.
- Field penetrometer testing to approximate unconfined compressive strength.
- Gradation testing in accordance with ASTM D114 and D422.
- Atterberg Limits testing in accordance with ASTM D4318.
- Unconfined Compression testing in accordance with ASTM D2166.
- Direct Shear testing in accordance with ASTM D3080.
- Corrosivity testing in accordance with California 643 (Minimum Resistivity), California 422 (Chlorides), California 417 (Sulfates) and California 643 (pH).

The results of the laboratory testing are presented on the boring logs opposite the sample tested and/or presented graphically in Appendix A.

III. FINDINGS AND ANALYSIS

GEOLOGIC SETTING

The surficial geology in the area of the project site is mapped as Lighthouse Coastal Terrace Deposits underlain by Unnamed Sandstone or Porphyritic Granodiorite of Monterey of Ross (Clark, Dupre', Rosenberg, 1997). The terrace deposits are described as *"Semi-consolidated, moderately well sorted*

marine sand containing thin, discontinuous gravel-rich layers." The Unnamed Sandstone is described as *"Marine; buff to light gray, poorly to well sorted arkosic sandstone, locally friable, locally conglomerate."* The bedrock and terrace deposits encountered during our field investigation are consistent with these descriptions.

SURFACE CONDITIONS

The sewer alignment to be replaced via pipe-bursting is located along Scenic Road between Ocean Avenue and the pump station located northeast of the intersection with Oceanview Avenue. The project area is completely paved. The road slopes gently to the south from the intersection with Ocean Avenue to the intersection with 8th Avenue. From the intersection of 8th Avenue to the intersection with Santa Lucia Avenue, the road is slightly domed to allow stormwater runoff to flow into the storm drain system. The road is relatively flat from the intersection of Santa Lucia Avenue to the pump station.

Scenic Road is bordered by residential properties on both sides between Ocean Avenue and 8th Avenue. South of 8th Avenue, Scenic Road is bordered by residential properties on the landward side, and a coastal bluff with associated trails and pathways along the seaward side.

Similar surface conditions were noted for the inland streets that were investigated in April of 2022 and were generally completely paved. These additional streets were generally narrow residential streets and bound by single family properties on either side.

An abundance of public utilities, including some abandoned ones, exist within the project area.

SUBSURFACE CONDITIONS

Our subsurface exploration consisted of the advancement of seven (7) test borings ranging in depth from 4 feet to 20½ feet below ground surface. The two shallow borings, drilled to depths of 4 feet and 4½ feet, were drilled within the existing sewer trench backfill to evaluate existing trench backfill conditions. The five deeper borings were drilled adjacent to the shallow borings to a maximum depth of 10-feet below the invert of the existing pipeline, or until bedrock was encountered. Eight (8) additional borings were advanced on April 20th, 2022 for the inland streets portion of the proposed sewer main replacement. The soil profiles and classifications, laboratory test results and groundwater conditions encountered for each test boring are presented in the Logs of Test Borings, in Appendix A. The general subsurface conditions are described below.

Subsurface conditions encountered within the shallow borings (B-4 and B-7) consisted of trench backfill described as sand with gravel and silty sand, respectively. The fines content (clay and silt percentage) ranged from 4.4% to 25.0%. The sandy material was described as fine to medium grained, sub-angular to sub-rounded shaped, and poorly graded. Gravels encountered within B-4 were described as fine grained and sub-angular to sub-rounded shaped. The density ranged from loose to medium dense.

Subsurface conditions encountered within the deeper borings (B-1, B-2, B-3, B-5, and B-6) consisted of primarily granular materials comprised of clayey sand, silty sand, sand with clay, sand with silt, and sand. These strata were typically fine to medium grained, sub-angular to sub-rounded shaped, and poorly graded. Fines contents within these granular materials range from ranging from 5.8% to 24.2%. The density ranged from very loose to medium dense.

A layer of highly plastic clay was encountered within B-3 from 17 feet to the maximum explored depth of 17½ feet. Fine grained soils were not encountered in any of the other test borings. The consistency of the clay strata was described as firm.

Sandstone bedrock was encountered within B-5 at a depth of 7½ feet below ground surface and Porphyritic Granodiorite was encountered within B-6 at a depth of 7½ feet below ground surface. The sandstone bedrock was described a medium dense to very dense, sand with silt and the granodiorite was described as very dense and mechanically pulverized to sand with silt and gravel. Fines content within the sandstone increased with depth and ranged from 3.7% to 13.5%.

Subsurface conditions encountered within the inland streets borings (B-8, B-9, B-10, B-11, B-12, B13, B14, and B-15) consisted of primarily granular materials comprised of clayey sand, silty sand, sand with clay, sand with silt, and sand. These strata were typically fine to medium grained, sub-angular to sub-rounded shaped, and poorly graded. The density ranged from very loose to dense. Weathered bedrock, generally described as dense clayey or silty sand, was encountered in borings B-9, B-10, and B-12 at depths ranging from 4½-feet to 14-feet.

Groundwater was encountered within B-1, B-11 and B-3 with initial approximate depths of 8-feet, 11-feet and 16-feet, respectively. The approximate depth to groundwater was measured at 9-feet within B-1 and 16-feet within B-3 at the end of drilling activities. Groundwater was not encountered within the other twelve borings.

It should be noted that the groundwater level was not allowed to stabilize for more than a few hours; therefore, the actual groundwater level may be higher or lower than initially encountered. The groundwater conditions described in this report reflect the conditions encountered during our drilling investigation in May of 2021 and April of 2022 at the specific locations drilled. It must be anticipated that the perched and regional groundwater tables may vary with location and could fluctuate with variations in rainfall, runoff, irrigation and other changes to the conditions existing at the time our measurements were made. We note that the groundwater measurements were taken in the spring of a drought year that was preceded by multiple below-average rain years. It should be anticipated that the groundwater table may rise significantly in the winter of non-drought years.

Please refer the Logs of Test Borings in Appendix A, for a more detailed description of the subsurface conditions encountered in each of our test borings at the subject site.

SOIL CORROSIVITY

In order to address the corrosivity potential at the subject site, testing was performed on seven (7) samples of the on-site soils likely to come in contact with concrete and buried metallic structures. The results are summarized as follows:

Table No.1 - Corrosivity Test Summary

Sample	Approximate Sample Depth (ft)	Soil Resistivity	Chloride	Sulfate (water soluble)	pH
		Ohm-cm	mg/kg	mg/kg	
2-5-1	13	4,303	99	594	7.9
2-5-2	12½	3,192	94	600	7.8
5-3-1	5½	1,637	376	116	7.8
5-3-2	5	2,075	255	37	8.7
9-3-2	5	5,027	12	164	7.3
11-3-2	5	6,569	29	99	6.9
15-3-2	5	6,340	10	24	7.0

According to the Cal Trans Corrosion Guidelines, Version 3.0 (March 2018), a site may be considered corrosive to foundation elements if one or more of the following conditions exist:

- The soil resistivity is *less than* 1,100 ohm-cm
- Chloride concentration is *greater than* or equal to 500 mg/Kg (ppm)
- Sulfate concentration is *greater than* or equal to 1500 mg/Kg (ppm)
- The soil pH is 5.5 *or less*

In comparing the test results to the threshold values, we have determined that the soils likely to be in contact with concrete and buried metallic structures are non-corrosive. The corrosion potential for any imported select fill should also be tested for corrosivity. Please refer to Appendix A for a site plan that shows the corrosivity test boring locations (Figure 2A through Figure 2F), associated boring logs, and specific results of the corrosivity testing by the analytical laboratory (Figure 20 and Figure 20A).

FAULTING AND SEISMICITY

Faulting

Mapped faults which have the potential to generate earthquakes that could significantly affect the subject site are listed in Table No. 2. The fault distances are approximate distances based the U.S. Geological Survey and California Geological Survey, Quaternary fault and fold database, accessed July 8, 2021 from the USGS website (http//earthquake.usgs.gov/hazards/qfaults/) and overlaid onto Google Earth.

Table No. 2 - Distance to Significant Faults

Fault Name	Distance (miles)	Direction
Cypress Point	0 to ½*	West-Southwest
San Gregorio	4	Southwest
Ascension	10	West-Southwest
Cachagua	10½	Southwest
Monterey Bay-Tularcitos	1	Northeast
Reliz	16½	Northeast

*The existing alignment along the south end of Carmelo Street between 17th Avenue and Scenic Road appears to follow the Cypress Point fault trace.

Seismic Shaking and CBC Design Parameters

Due to the proximity of the site to active and potentially active faults, it is reasonable to assume the site will experience high intensity ground shaking during the lifetime of the project. Structures founded on thick, soft soil deposits are more likely to experience more destructive shaking, with higher amplitude and lower frequency, than structures founded on bedrock. Generally, shaking will be more intense closer to earthquake epicenters. Thick, soft soil deposits large distances from earthquake epicenters, however, may result in seismic accelerations significantly greater than expected in bedrock.

The following peak ground accelerations (PGA) were obtained for the project site from the online California Geologic Survey – PSHA Ground Motion Interpolator.

Table No. 3 – Site Specific Peak Ground Accelerations

Probability of Exceedance	PGA
2% in 50 Years	0.62g
10% in 50 Years	0.35g

The recommendations of this report are intended to reduce the potential for structural damage to an acceptable risk level, however strong seismic shaking could result in damage to improvements and the need for post-earthquake repairs.

GEOTECHNICAL HAZARDS

A quantitative analysis of geotechnical hazards was beyond our scope of services for this project. In general however, the geotechnical hazards associated with the project site include seismic shaking (discussed above), ground surface fault rupture, liquefaction, lateral spreading, landsliding, and expansive soils. A qualitative discussion of these hazards is presented below.

Ground Surface Fault Rupture

Pacific Crest Engineering Inc. has not performed a specific investigation for the presence of active faults at the project site. The Cypress Point fault has been mapped along the south end of Carmelo Street and may underlie the existing sewer main alignment. Based upon our review of the Monterey County GIS Hazard Maps, the remainder of the project area is not mapped within a fault hazard zone.

Ground surface fault rupture typically occurs along the surficial traces of active faults during significant seismic events. The potential for ground surface rupture resulting from a seismic event on the Cypress Point fault, including the potential for lateral and/or vertical displacements, is outside of our purview and cannot be characterized. If the project owner requires a risk assessment of this hazard, a certified engineering geologist should be consulted.

Liquefaction and Lateral Spreading

Based upon our review of the Monterey GIS Hazard Maps, the majority of the project site is not mapped within a liquefaction hazard zone. Carmelo Street south of 16th Avenue is mapped within a zone of moderate to high liquefaction potential.

Liquefaction tends to occur in loose, saturated fine grained sands and coarse silt, or clays with low plasticity. Our borings generally encountered fine-grained sands with varying amounts of clay, silt, and gravel. In our opinion, these subsurface conditions corroborate the mapping of the project site as having a low potential for liquefaction to the depths explored. Dense soil/bedrock was noted at relatively shallow depths in borings B11 and B12 on Carmelo Street, therefore we infer that this portion of the alignment may lie outside of the mapped liquefaction zone.

Liquefaction induced lateral spreading occurs when a liquefied soil mass fails toward an open slope face or fails on an inclined topographic slope. Our analysis indicates that the site has a low potential for liquefaction, consequently the potential for lateral spreading is also considered low.

Landsliding

The ground along the sewer alignment is relatively flat to gently sloping and not subject to landsliding hazards. Portions of the pipeline alignment along Scenic Road are located adjacent to a coastal bluff that is subject to active process of wave action, erosion, and instability. However, in our opinion the proposed method of pipe bursting is not likely to pose an increased risk to bluff stability.

Expansive Soils

The terrace deposit materials are interbedded with low to highly expansive clay soils. Expansive soils tend to heave during the rainy season and contract during the summer. This cyclical volume change within the soil will occur whenever the moisture content of the soil fluctuates, whether it occurs seasonally or otherwise. Seasonal moisture fluctuation and subsequent expansion and contraction of these types of soils typically occurs more so near the ground surface.

IV. DISCUSSION AND CONCLUSIONS

GENERAL

1. The results of our investigation indicate that the proposed sewer main replacement project is feasible from a geotechnical engineering perspective, provided the recommendations presented in this report are included in the design and construction of the project.

2. Pipe installation plans should be reviewed by Pacific Crest Engineering Inc. during their preparation and prior to contract bidding.

3. Pacific Crest Engineering Inc. should be notified at least four (4) working days prior to any site clearing and grading operations on the property in order to observe the stripping and disposal of unsuitable materials, and to coordinate this work with the grading contractor. During this period, a pre-construction conference should be held on the site, with at least the client or their representative, the grading contractor, a City representative and one of our engineers present. At this meeting, the project specifications and the testing and inspection responsibilities will be outlined and discussed.

4. Field observation and testing must be provided by a representative of Pacific Crest Engineering Inc., to enable them to form an opinion as to the degree of conformance of the exposed site conditions to those foreseen in this report, the adequacy of the site preparation, the acceptability of fill materials, and the extent to which the earthwork construction and the degree of compaction comply with the specification requirements. Any work related to grading or foundation excavation that is performed without the full knowledge and direct observation of Pacific Crest Engineering Inc., the Geotechnical Engineer of Record, will render the recommendations of this report invalid, unless the Client hires a new Geotechnical Engineer who agrees to take over complete responsibility for this report's findings, conclusions and recommendations. The new Geotechnical Engineer must agree to prepare a Transfer of Responsibility letter. This may require additional test borings and laboratory analysis if the new Geotechnical Engineer does not completely agree with our prior findings, conclusions and recommendations.

PRIMARY GEOTECHNICAL CONSIDERATIONS

5. Based upon the results of our investigation, it is our opinion that the primary geotechnical issues associated with the design and construction of the proposed project are the following:

a. *Moderately Difficult to Challenging Site Conditions for Pipe Bursting:* In accordance with the guidelines of the National Association of Sewer Service Companies (NASSCO), portions of the Scenic Road project area will be classified as a "Moderately Difficult to Challenging" pipe bursting project. This classification is based on the presence of medium dense to very dense sands which are resistant to being compressed as the bursting head is advanced. In addition, bedrock was encountered in Borings B-5 and B-7 at a depth of 7 ½ feet. This can be a very challenging pipe bursting environment depending on trench width and backfill material.

b. *Unknown Existing Pipe Bedding and Trench Conditions*: In order to minimize the risks of damaging the existing sewer pipe, our exploratory borings within trench backfill were terminated approximately two feet above the top of the existing pipes. Therefore, we do not have information regarding the type of bedding material that encompasses the existing pipes nor the density or consistency of the bedding material. Additionally, the widths of the original trenches excavated for the placement of the existing pipes is not known. Therefore, the amount of trench backfill that will lie between the sides of the new pipe and the undisturbed native soils are not known.

   The presence of a mapped fault trace along the south side of Carmelo Drive indicates that variable trench conditions could be present along this section of the alignment. Highly variable excavation conditions should be anticipated.

c. *Ground Movement – Settlement and Heave:* Pipe bursting methods of pipe installation have the potential to cause ground settlement or heave. The contractor installing the new pipe should closely follow the general pipe bursting or reaming guidelines to mitigate the risk for heave or ground deformation. These guidelines include maintaining two to three pipe diameters from adjacent structures or providing a clearance of at least 10 times the difference in diameters between the new and existing pipes.

   General pipe bursting guidelines are available in Appendix B of this report.

d. *Existing Utilities:* The project plans indicate there are numerous existing utility lines along the proposed sewer replacement alignment. The utilities include but may not be limited to storm drain lines, PG&E gas and electrical lines, electrical conduits, AT&T conduits, water lines and irrigation lines. The depth of many of these utilities is not known. An appropriate amount of clearance is required to mitigate the potential for pipe bursting to damage the existing utilities. Recommended clearances are discussed in the PIPE BURSTING section of this report.

e. *Shallow Groundwater*: Groundwater was encountered within B-1, B-3 and B-11 at approximate depths of 8, 16, and 11 feet, respectively.

f. *Strong Seismic Shaking:* The project site is located within a seismically active area and strong seismic shaking is expected to occur within the design lifetime of the project. Improvements should be designed and constructed in accordance with the most current CBC and the recommendations of this report to minimize reaction to seismic shaking. Structures built in accordance with the latest edition of the California Building Code have an increased potential for experiencing relatively minor damage which should be repairable, however strong seismic shaking could result in architectural damage and the need for post-earthquake repairs.

V. RECOMMENDATIONS

PIPE BURSTING

General

1. Pipe bursting is a well-established trenchless technique for replacing deteriorated or undersized pipes with a new pipe of equal or larger diameter. Pipe bursting can be either pneumatic, hydraulic expansion or static pull. Typically pipe bursting involves the insertion of a conically shaped bursting head into an existing pipe. The bursting head is larger than the inside diameter of the old pipe and slightly larger than the outside diameter of the new pipe. The new pipe is connected to the rear of the bursting head. As the bursting head is pulled or jacked through the existing pipe it fractures the existing pipe as it pulls or pushes a new pipe behind the bursting head. The fragments of the old pipe are forced into the surround soil and the surrounding soil is compressed. The bursting head and the new pipe are advanced from an "insertion pit" while a pulling rod or cable are pulled from a "reception pit". Pipes made from brittle material capable of fracturing into fragments, such as asbestos, plain concrete, vitrified clay, and some plastics, are suitable for bursting. Recent methods for bursting incorporating cutter heads can be used on metallic pipes such as ductile iron.

2. The National Association of Sewer Service Companies (NASSCO) classifies pipe bursting projects as follows:

Table No. 4 – NASSCO Pipe Bursting Classification

Criteria	**A** - Routine (all of the criteria below apply)	**B** – Moderately Difficult to Challenging	**C** – Challenging to Extremely Challenging
Depth	Less than 12 feet	12 to 18 feet	More than 18 feet
Existing Pipe	4 to 12 inches	12 to 20 inches	20 to 36 inches
New Pipe Diameter	Size for Size or one diameter upsize	Two diameter upsize	Three or more diameter upsize
Burst Length	Less than 350 feet	350 to 450 feet	More than 450 feet
Trench Width	Relatively wide trench compared to upsize diameter	Trench width less than 4" wider than upsize diameter	Incompressible soils (very dense sand, hard clay, rock) outside trench
Soil	Compressible soils outside trench (soft clay, loose sand)	Moderately compressible soils outside trench (medium dense to dense sand, medium to stiff clay)	Constricted trench geometry (width less than or equal to upsize diameter).

Based on the materials encountered in our borings, we consider the project to feasibly range between the following classifications:

Type A – Routine – Approximate project limits from Ocean Avenue to 12th Avenue
Type B – Moderately Difficult to Challenging – Approximate project limits from 12th Avenue to pump station.

3. Since pipe bursting is a specialized method of installing pipes, we recommend that the pipe bursting only be performed by a contractor with a demonstrated record of successful experience on similar projects including comparable pipe sizes, depths, and pipe upsizing.

Clearance of Utilities

4. The project plans indicate that there are numerous existing utility lines along the proposed sewer replacement alignment. The utilities include but may not be limited to storm drain lines, PG&E gas and electrical lines, electrical conduits, AT&T conduits and water lines. The depth of many of these utilities is not known.

5. Ground movement associated with pipe bursting may damage nearby utilities. Parallel pipes are susceptible to transitory disturbance as the pipe bursting operation advances. Utilities that cross the pipe bursting alignment are subject to longitudinal bending as they are pushed away from the bursting operation. Mechanical joints on nearby utilities can leak when the ground surrounding the nearby utility is deformed. As a general recommendation, the clearance distance between the pipe to be burst and the nearby utility should be a minimum of 2 diameters of the replacement pipe.

6. To prevent damage to existing utilities it is essential to identify their existence and location prior to commencing with the pipe bursting operation. General surface utility location methods, keyhole type vacuum excavations or other applicable methods should be used to locate utilities within the bursting zone of influence and to verify their clearance from the pipe to be burst.

Potential Ground Deformation and Surface Displacements

7. Nearby structures and site improvements can be damaged from ground movement associated with pipe bursting. Measures and monitoring to mitigate potential heave should be employed in areas with existing site improvements, including culverts and roadways.

8. The soils displace in the direction of the least resistance. The amount and characteristics of the ground displacement depends on:

a. Degree of upsizing.
b. Type and compaction level of the backfill soil and bedding material that directly surrounds the pipe.
c. Type and compressibility of the native soil directly outside the existing trench.
d. The geometry of the existing trench.
e. The depth of bursting.

9. When the soil is relatively well compacted, the bursting process is likely to result in surface heave. Surface heave is also likely when the bursting pipe is to be significantly upsized.

10. The rule of thumb regarding heave and pipe bursting is that heave is typically not a problem provided that the number of feet over the top of the new pipe is equal to the following:

Minimum Depth of Cover = (Expander Head OD – Existing Pipe ID) x 12

11. This preliminary value should be modified, as necessary, as additional conditions are identified.

12. Utilities that cross the pipe to be burst should be protected from ground deformation by potholing beneath them and excavating the soil beneath them by at least 3 inches. Parallel utilities with a separation of less than 2½ feet should be protected with stress relief measures.

13. The contractor's choice of equipment and procedures greatly affects the vertical and horizontal extent of surface deformation. The contractor should submit to the District their estimates of the anticipated maximum vertical and horizontal surface heave. Additionally, the contractor should submit their proposed methods and measures for minimizing surface heave and damage to nearby structures and utilities.

14. Given that portions of the project area may encounter "Moderately Difficult to Challenging" conditions, we recommend a thorough ground movement monitoring program be employed. The monitoring program should include a preconstruction survey of all nearby buildings and structures. The survey should document all existing cracks, cosmetic problems and structural deficiencies prior to commencement of pipe bursting. Nearby structures and utilities must be actively and continuously monitored throughout the pipe bursting operation. The monitoring program should be submitted for review and approval and should be in-place prior to commencing the pipe bursting operation.

Ground Vibrations

15. All pipe bursting projects generate vibrations. Research has shown that ground vibrations are typically a problem when pipe bursting is installed using the pneumatic method. Damaging vibration levels typically are not a problem for buried structures or utilities that lie 2½ feet, or more, from the bursting head. For sensitive surface structures, damaging vibration level typically effect structures within 8 feet of the bursting head. The contractor should monitor nearby utilities and structures for damaging vibrations throughout the pipe bursting operation and provide countermeasures to mitigate damaging vibrations, as necessary.

MODULUS OF SUBGRADE REACTION

16. Vertical loading on a flexible pipe can cause the pipe to deform. The diameter of the pipe tends to decrease in the vertical direction and increase in the horizontal direction. The composite modulus of subgrade reaction (E'_c) is used in the design of buried flexible pipes to estimate the passive resistance developed by the soil when the pipe is vertically loaded. E'_c is a function of depth of cover, trench width, the diameter of the pipe, the modulus (E'_b) of the pipe zone material (the soil and bedding material directly surrounding the pipe), and the modulus (E'_n) of the native material adjacent to the trench walls.

17. The native soils encountered at the approximate pipeline depths during our subsurface investigation generally consisted of predominately loose to dense granular materials with varying amounts of silt and clay (SP, SM, SC). The weathered bedrock and bedrock is dense to very dense. The existing trench backfill generally consisted of loose to medium dense poorly graded sand and silty sand (SP, SM).

18. The following table provides preliminary values for the Modulus of Subgrade Reaction (E'_n) for the native material adjacent to the trench walls.

Table No. 5 – Modulus of Subgrade Reaction (E'_n) Values

Type of Soil	Modulus of Subgrade Reaction (E'_n)[1] for open-cut trench installation
Expansive Clays and Silts (CH, MH, Liquid Limit >50)	Do not use as backfill within 3 feet of pipe
Clays and Silts (CL, CI, ML)	700 psi[2]
Sand (SM, SC)	900 psi[2]
Sand and Gravel (SW, SP, GW, GP)	1,000 psi[2]

[1]Jey Jeyapalan P. E., "Modulus of Soil Reaction (E') Values for Pipeline Design"

[2]The above values apply when the soil cover is between 0 and 5 feet. These values may be increased by 25 psi for every foot of soil cover above the pipe greater than 5 feet.

19. During the pipe-bursting installation, the soils directly surrounding the pipe will be further compacted as the existing pipe is broken by the bursting head and the fragments and adjacent soil are pushed into the surrounding soil. For pipe-bursting, the E'_b may be taken as a constant 1,400 psi.

20. To determine E'_c for the buried pipe E'_n for the native soil and E'_b for the backfill material must be determined then combined using the following formula:

$$E'_c = S_c\, E'_b$$

The value of S_c is a function of E'_n/E'_b and B_d/D where B_d is the width of the trench at the pipeline and D is the diameter of the pipe.

Table No. 6 – S_c Values

E'_n/E'_b	S_c for B_d/D*					
	1.5	2.0	2.5	3.0	4.0	5.0
0.1	0.15	0.30	0.60	0.80	0.90	1.00
0.2	0.30	0.45	0.70	0.85	0.92	1.00
0.4	0.50	0.60	0.80	0.90	0.95	1.00
0.6	0.70	0.80	0.90	0.95	1.00	1.00
0.8	0.85	0.90	0.95	0.98	1.00	1.00
1.0	1.00	1.00	1.00	1.00	1.00	1.00
1.5	1.30	1.15	1.10	1.05	1.00	1.00
2.0	1.50	1.30	1.15	1.10	1.05	1.00
3.0	1.75	1.45	1.30	1.20	1.08	1.00
>=5.0	2.00	1.60	1.40	1.25	1.10	1.00

*Jey Jeyapalan P. E., "Modulus of Soil Reaction (E') Values for Pipeline Design"

TRENCHING, OPEN-CUT EXCAVATIONS AND SHORING

21. Open-cut excavations may be used to create trenches for pipeline installation and for constructing the insertion and reception pits associated with pipe bursting. There may be some sections of the pipeline alignment where it may be feasible to slope the trench sides to provide a safe environment for pipe installations. Alternatively, the trenches and pit walls may be vertically cut and shored. Pipe bursting pits and trench excavations should have either temporary sidewall slopes constructed in accordance with CAL-OSHA guidelines or be mechanically shored.

22. It must be understood that on-site safety is the ***sole responsibility*** of the Contractor, and that the Contractor shall designate a ***competent person*** (as defined by CAL-OSHA) to monitor the slope excavation prior to the start of each work day, and throughout the work day as conditions change. The competent person designated by the Contractor shall determine if flatter slope gradients are more appropriate, or if shoring should be installed or modified to protect workers in the vicinity of the slope excavation. Refer to Title 8, California Code of Regulations, Sections 1539-1543.

23. Excavation shoring is the sole responsibility of the contractor. All excavations must be evaluated for stability prior to entry. The contractor must act in accordance with the project specifications, Cal/OSHA and/or any other applicable government regulation concerning excavation safety and shoring.

24. Excavation design and shoring systems should be submitted to the project engineers a minimum of three weeks prior to construction for a review to determine the conformance of the design with standard engineering practices and specific site conditions. The shoring submittal should include alternative systems that are contingent upon the actual soil and groundwater conditions encountered during construction. The contractor must be prepared to install the alternative shoring systems in a timely manner should the initial system not be appropriate for achieving the minimum safety and performance requirements. The actual shoring systems used should be modified during construction, if necessary, and must be based on the actual soil and groundwater conditions encountered at the time of construction.

25. We anticipate that a braced excavation support system will be used for open-cut trenching in most areas. A braced excavation system could limit lateral deflection of the trench walls and limit settlement behind the shoring.

26. Based on our field and laboratory investigations we recommend that for sloping and benching design purposes, the native soils be preliminarily classified as Type C soils in accordance with Cal/OSHA. The actual sloping and benching systems should be based on the actual soil and groundwater conditions encountered at the time of construction. Classification of the bedrock will depend on the bedding angles, fracturing and competency of the rock when exposed.

27. Shoring systems that do not positively buttress the excavation walls and allow trench side walls to move into the excavation may result in settlement and damage to adjacent pavement, utilities, and structures. To help create a positive buttress, we recommended that all voids behind the shoring system be completely filled with soil or gravel backfill while the shoring work is in progress. The

following table provides a preliminary rough estimate of potential surface settlement for positively shored excavations.

TABLE No. 7 - Potential Surface Settlement of Passively Shored Excavations

Soil Type	Surface Settlement (% of Excavation Depth)	Lateral Zone of Disturbance (Multiples of Excavation Depth)
Stiff Clay	<1%H	2H
Medium Stiff Clay	1-2%H	3-4H
Sand	0.5%H	H

28. The temporary shoring wall system chosen by the designer should be designed using the geotechnical design criteria presented in the "Lateral Pressures" section of this report.

29. The "top" of any temporary cut slope should be set-back at least ten feet (measured horizontally) from any nearby structure or property line. Any pit or trench excavation that cannot meet these side slope gradients will need to have a shoring system designed to support steeper sidewall gradients.

EXCAVATABILITY

30. It is currently anticipated that the replacement pipeline will be installed at current lines and grades, within previously excavated trench lines. Based on the soils encountered in our borings, we anticipate that the trenches and pipe-bursting pits may generally be excavated using appropriately-sized, conventional excavators. However, it must be anticipated that hard bedrock will be encountered within new excavations, including insertion pits to be excavated outside of existing trenches. Specialty rock excavating equipment may be necessary if hard bedrock is encountered in new excavations. Contractors must independently assess the excavatability of the earth material along the pipeline alignment and choose suitable equipment and excavation methods. It should be anticipated that excavating through bedrock sections will be relatively slow.

EXCAVATION DEWATERING

31. Groundwater was encountered at a depth of 8 feet within B-1, 16 feet within B-3, and 11 feet within B-11. The borings were open only for the duration of drilling and therefore, the absence of groundwater in our borings does not necessarily represent the static equilibrium groundwater levels. The actual groundwater levels at the time of construction may be higher than the groundwater conditions logged on May 24, 2021 and April 20, 2022. It must be anticipated that the perched and regional groundwater tables may vary with location and will fluctuate with variations in rainfall, runoff, irrigation and other changes to the conditions existing at the time our measurements were made. It should be anticipated that the groundwater table will rise during the rainy season and in the summers that follow above normal rainfall.

32. Pipeline construction should be performed in dry excavations. The design, construction and installation of the groundwater dewatering systems, if required, is the sole responsibility of the Contractor. The groundwater dewatering systems should be based on the actual groundwater

conditions encountered at the time of construction. Dewatering plans should be submitted to the District for review prior to execution.

GENERAL EARTHWORK

33. The earthwork anticipated for this project consists of clearing the pipe-bursting pits and the trenching areas of vegetation and pavement, the excavation and backfilling of the trenches and pipe-bursting pits, and the restoration of the disturbed pavement, sidewalk, and landscape areas.

34. The initial preparation of the site will consist of the removal of all surface and subsurface deleterious materials, pavement, curbs, gutters, sidewalks, buried utilities, irrigation lines, trees, and shrubs. Tree removal should include the entire stump and root ball. Abandoned septic tanks and leaching lines, if found, may need to be completely removed. This material must be removed from the site.

35. Any voids created by removal of tree and root balls, subsurface obstructions, septic tanks, and leach lines must be backfilled with properly compacted native soils that are free of organic and other deleterious materials or with approved imported fill.

36. Following the installation of the new sewer pipeline(s), the trenches and pipe bursting pits should be backfilled with either approved native soil or import fill. All native and import fill should be placed in maximum 8 inch lifts, before compaction.

37. Native or imported soil proposed for use as engineered fill should meet the following requirements:

a. free of organics, debris, and other deleterious materials,
b. free of "recycled" materials such as asphaltic concrete, concrete, brick, etc.,
c. granular in nature, well graded, and contain sufficient binder to allow utility trenches to stand open,
d. free of rocks in excess of 2 inches in size.

In addition to the above requirements, import fill should have a Plasticity Index between 4 and 12, and a minimum Resistance "R" Value of 30, and be non-expansive.

38. Excavated native soil may be re-used as engineered fill provided it meets the criteria provided below. *We recommend that the upper 2 feet of trench backfill beneath site improvements including pavements, sidewalks, gutters, etc. consist of approved non-expansive engineered fill or Class 2 aggregate base.*

39. Engineered fill should be placed in maximum 8 inch lifts.

40. All soil on the project should be compacted to the minimum compaction requirements outlined in the following table:

Table No. 8 - Minimum Compaction Requirements

Percent of Maximum Dry Density	Location
95%	• All aggregate base and subbase in pavement areas • The upper 8 inches of subgrade in pavement areas • All utility trench backfill in pavement areas
90%	All remaining native soil and fill material

41. The moisture conditioning procedure will depend on the time of year that the work is done, but should result in the native sandy soils being within 1 to 3 percent of their optimum moisture content at the time of compaction.

42. If earthwork is done during or soon after the rainy season, the on-site soils and other materials may be too wet in their existing condition to be used as engineered fill. These materials may require a diligent and active drying and/or mixing operation to reduce the moisture content to the levels required to obtain adequate compaction as an engineered fill. If the on-site soils or other materials are too dry, water may need to be added. In some cases the time and effort to dry the on-site soil may be considered excessive, and the import of aggregate base may be required.

43. The maximum dry density will be obtained from a laboratory compaction curve run in accordance with ASTM Procedure #D1557. This test will also establish the optimum moisture content of the material. Field density testing will be performed in accordance with ASTM Test #D6938 (nuclear method).

44. We recommend field density testing be performed in maximum 2 foot elevation differences. In general terms, we would recommend at least one compaction test per 200 linear feet of utility trench. This is a subjective value and may be changed by the Geotechnical Engineer based on a review of the final project layout and exposed field conditions.

45. Samples of any proposed imported fill planned for use on this project should be submitted to Pacific Crest Engineering Inc. for appropriate testing and approval not less than ten (10) working days before the anticipated jobsite delivery. This includes proposed import trench sand, drain rock and aggregate base materials. Imported fill material delivered to the project site without prior submittal of samples for appropriate testing and approval must be removed from the project site.

CONTROLLED LOW STRENGTH MATERIAL (CLSM)

46. Controlled low strength material (CLSM) is a flowable, self-compacting, cementitious material used in lieu of compacted soil. CLSM is a mixture of cement, pozzolan, coarse and fine aggregate, and water mixed in accordance with ASTM C94. CLSM used as fill shall be in accordance with the following:

a. The CLSM should have a consistency such that the material flows easily into all openings. A stiffer mixture may be required on sloping ground. If a stiffer mixture is required, vibration should be performed to ensure that the CLSM fills all spaces and openings.

b. When fully cured the CLSM should be hand excavatable and have a minimum 28-day compressive strength of 50 psi and a maximum 28-day compressive strength of 150 psi.

c. Placement of backfill, pavement sections or concrete over the CLSM should not take place until the CLSM passes the ball drop test per ASTM 6024.

d. If the backfill is not placed within 8 hours, a 6-inch cover of moist earth should be placed over the CLSM. If the air temperature is 50°F or less, the earth cover should be 18 inches thick.

e. CLSM shall not be placed when the air temperature is below 40°F unless the air temperature is 35°F or more and the temperature is rising.

47. Pipes in trenches backfilled with CLSM have a tendency to float. Pipe anchors and sequential backfilling can mitigate the potential for floating. If the sequential backfilling method is selected, the height to which the CLSM is placed is a function of the buoyant force and the amount of resistance provided by the anchoring system. Sequential backfilling requires the trench to remain open for a longer period of time.

UTILITIES

48. Utility pipes should be designed and constructed so that the top of pipe is a minimum of 24 inches below the finish subgrade elevation of any road or pavement areas. Any pipes within the top 24 inches of finish subgrade should be concrete encased, per design by the project civil engineer.

49. For the purpose of this section of the report, backfill is defined as material placed in a trench starting one foot above the pipe, and bedding is all material placed in a trench below the backfill.

50. Unless concrete bedding is required around utility pipes, free-draining clean sand should be used as bedding. Sand bedding should be compacted to at least 95 percent relative compaction. Clean sand is defined as 100 percent passing the #4 sieve, and less than 5 percent passing the #200 sieve.

51. Approved imported clean sand or native soil should be used as utility trench backfill. Backfill in trenches located under and adjacent to structural fill, foundations, concrete slabs and pavements should be placed in horizontal layers no more than 8 inches thick. This includes areas such as sidewalks, patios, and other hardscape areas. Each layer of trench backfill should be water conditioned and compacted to at least 95 percent relative compaction.

52. We recommend that the upper 2 feet of trench backfill beneath site improvements including pavements, sidewalks, gutters, etc. consist of approved non-expansive engineered fill or Class 2 aggregate base.

53. Utility trenches which carry "nested" conduits (stacked vertically) should be backfilled with a control density fill (such as 2-sack sand\cement slurry) to an elevation one foot above the nested conduit stack. The use of pea gravel or clean sand as backfill within a zone of nested conduits is not recommended.

54. A representative from our firm should be present to observe the bottom of all trench excavations, prior to placement of utility pipes and conduits. In addition, we should observe the condition of the trench prior to placement of sand bedding, and to observe compaction of the sand bedding, in addition to any backfill planned above the bedding zone.

55. Jetting of the trench backfill is not recommended as it may result in an unsatisfactory degree of compaction.

56. Trenches must be shored as required by the local agency and the State of California Division of Industrial Safety construction safety orders.

LATERAL PRESSURES

57. Vertical excavations may be temporarily shored with a variety of methods including sheet piling, soldier piers with lagging, braced shoring, or other techniques. Our borings indicate that the vertical excavations associated with the project will be excavated in a variety of divergent earth material including silty sand, clayey sand, sand, and bedrock. Shoring methods may vary and will depend on the soil actually exposed along the trench sides. Shoring design and construction must be provided by the contractor and their shoring designer.

58. The following lateral earth pressure values are preliminary values to be used for the design of structures that will be retaining soil. These values are based on the predominately sandy soils encountered in our borings. Active earth pressure values may be used when walls are free to yield an amount sufficient to develop the active earth pressure condition (about ½% of height). When walls are restrained use at-rest values.

TABLE No. 9 – Lateral Earth Pressures

Ultimate Static Lateral Earth Pressures Expressed as an Equivalent Fluid Density in a triangular distribution		
Backfill Slope (H:V)	Active Earth Pressure (psf/ft of depth)	At-rest Earth Pressure (psf/ft of depth)
Level	45	75
3:1	48	98
2:1	60	108
For resisting passive earth pressure use 250 psf/ft of depth. Ignore passive pressure in the upper two feet of embedment.		

59. Any live or dead loads which will transmit a force to the wall, refer to the Surcharge Pressure Diagram in Appendix A.

60. If applicable, traffic surcharges on retaining walls may be simulated by assuming that an additional 2 feet of soil (250 psf) exists on the grade above the trench.

61. For flexible (yielding) retaining walls, the resultant seismic force on the wall is $10H^2$ where H is the height of the retained soil in feet. This force has been estimated using the Mononobe-Okabe method of analysis as modified by Whitman (1990), and assumes a yielding wall condition. For rigid (non-yielding) retaining walls, the resultant seismic force on the wall is $21H^2$. Note that the resultant seismic force should be assumed to act at a point 0.33H up from the base of the wall.

62. The above criteria are based on fully drained conditions. If the walls are not able to be fully drained, hydrostatic forces should be added to the wall, as appropriate.

PAVEMENT DESIGN

63. The design of pavement sections was beyond our scope of services for this project. To have the selected pavement sections perform to their greatest efficiency, it is very important that the following items be considered:

a. Properly scarify and moisture condition the upper 8 inches of the subgrade soil and compact it to a minimum of 95% of its maximum dry density, at a moisture content of 1 to 3% over the optimum moisture content for the soil.

b. Provide sufficient gradient to prevent ponding of water.

c. Use only quality materials of the type and thickness (minimum) specified. All aggregate base and subbase must meet Caltrans Standard Specifications for Class 2 materials and be angular in shape. All Class 2 aggregate base should be ¾ inch maximum in aggregate size.

d. Compact the base and subbase uniformly to a minimum of 95% of its maximum dry density.

e. Use ½ inch maximum, Type "A" medium graded asphaltic concrete. Place the asphaltic concrete only during periods of fair weather when the free air temperature is within prescribed limits by Cal Trans Specifications.

f. Maintenance should be undertaken on a routine basis.

EROSION CONTROL

64. The surface soils are classified as having a moderate potential for erosion. Therefore, as applicable exposed ground surfaces should be planted with ground cover and continually maintained to minimize surface erosion. For specific and detailed recommendations regarding erosion control on and surrounding the project site, the project civil engineer or an erosion control specialist should be consulted.

PLAN REVIEW

65. We respectfully request an opportunity to review the project plans and specifications during preparation and before bidding to verify that the recommendations of this report have been included and to provide additional recommendations, if needed. These plan review services are also typically required by the reviewing agency. Misinterpretation of our recommendations or omission of our requirements from the project plans and specifications may result in changes to the project design during the construction phase, with the potential for additional costs and delays in order to bring the project into conformance with the requirements outlined within this report. Services performed for review of the project plans and specifications are considered "post-report" services and billed on a "time and materials" fee basis in accordance with our latest Standard Fee Schedule.

VI. LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. This Geotechnical Investigation was prepared specifically for MNS Engineers, Inc. and for the specific project and location described in the body of this report. This report and the recommendations included herein should be utilized for this specific project and location exclusively. This Geotechnical Investigation should not be applied to nor utilized on any other project or project site.

2. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at the time, our firm should be notified so that supplemental recommendations can be provided.

3. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are called to the attention of the Architects and Engineers for the project and incorporated into the plans, and that the necessary steps are taken to ensure that the Contractors and Subcontractors carry out such recommendations in the field.

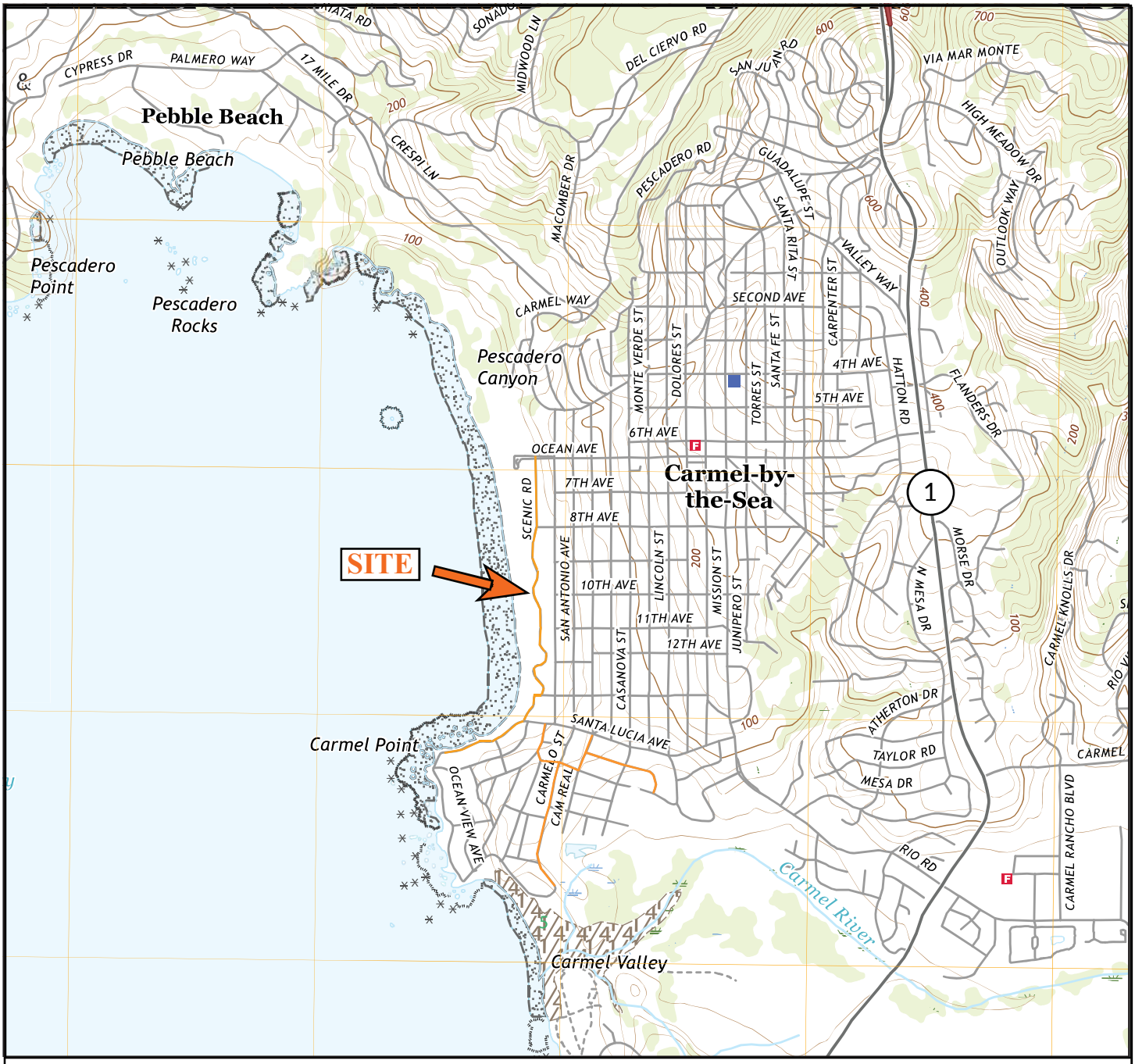
4. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural process or the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside of our control. This report should therefore be reviewed in light of future planned construction and then current applicable codes. This report should not be considered valid after a period of two (2) years without our review.

5. This report was prepared upon your request for our services in accordance with currently accepted standards of professional geotechnical engineering practice. No warranty as to the contents of this report is intended, and none shall be inferred from the statements or opinions expressed.

6. The scope of our services mutually agreed upon for this project did not include any environmental assessment or study for the presence of hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site.

APPENDIX A

Regional Site Map
Site Map Showing Test Borings
Key to Soil Classification
Log of Test Borings
Corrosivity Test Summary
Atterberg Limits
Direct Shear Test Results
Surcharge Pressure Diagram



0 2000 ft.

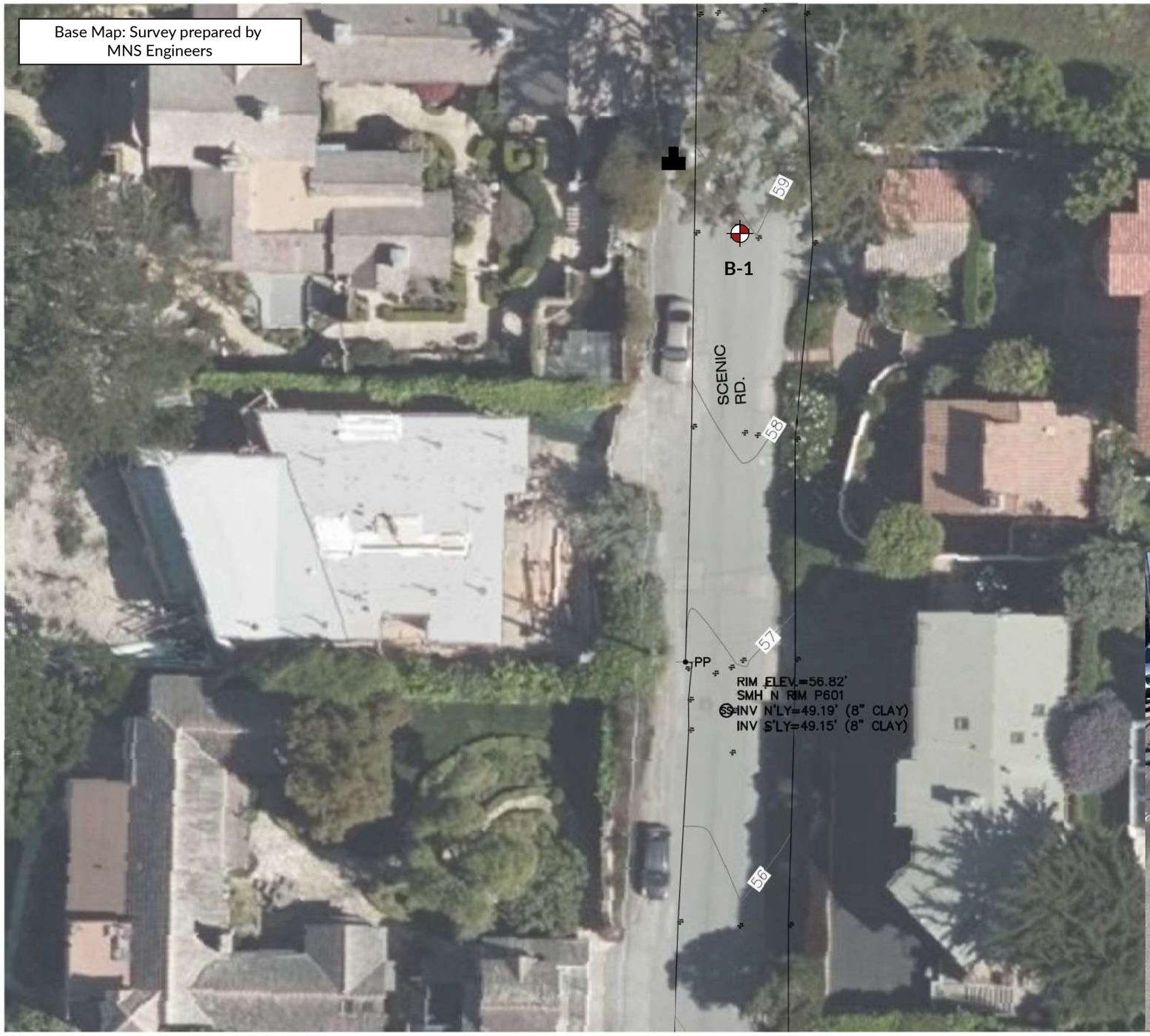
N

Base Map: United States Geological Survey
Monterey Quadrangle, California
Monterey County, 7.5 Minute Series, 2018

Pacific Crest ENGINEERING INC

Regional Site Map
Scenic Road Sewer Rehabilitation Project
Carmel-by-the-Sea, California

Figure No. 1
Project No. 2123
Date: 6/10/22



N

0 20 40

Scale: 1 inch = 20 feet

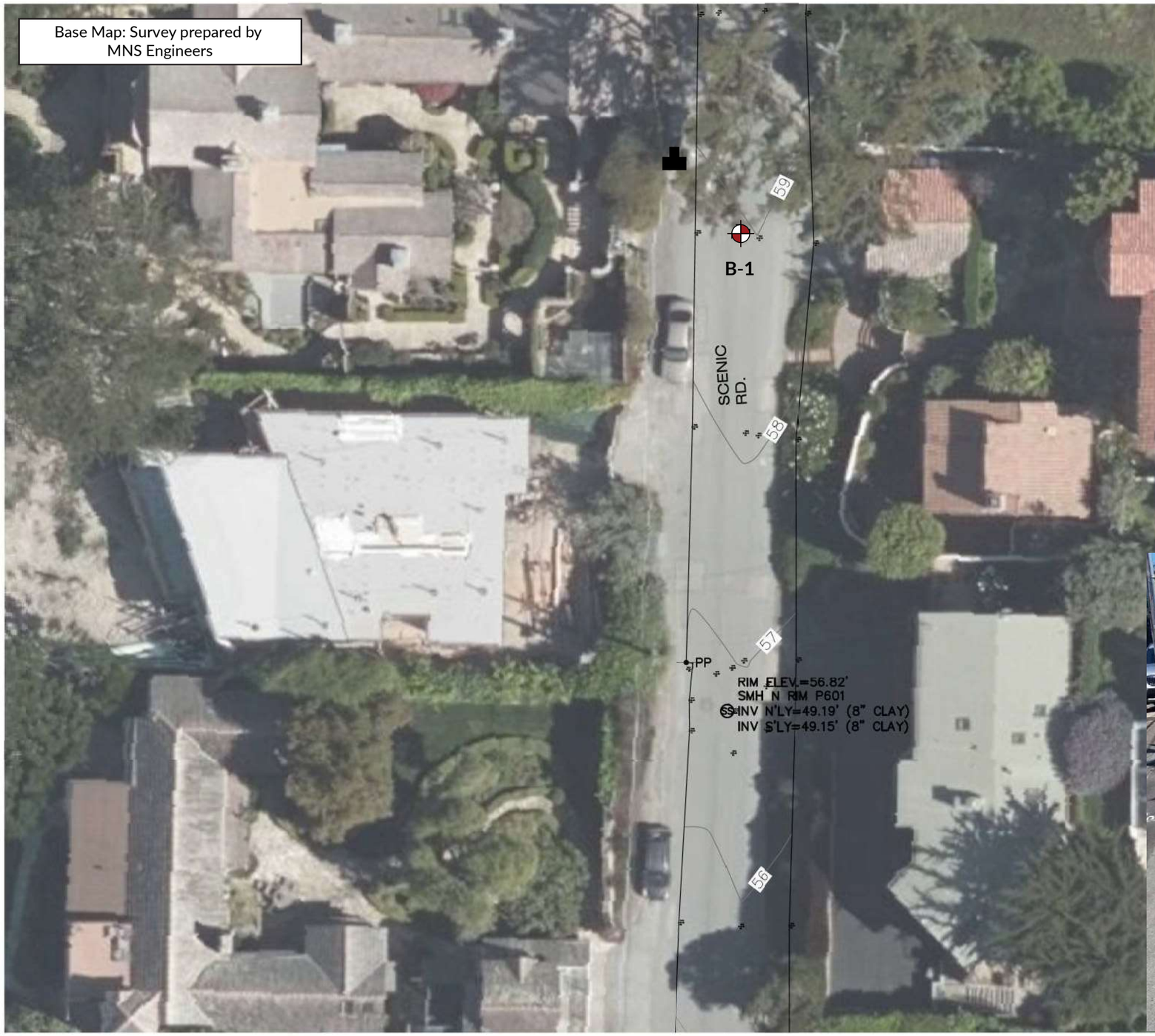
LEGEND:

B-1 Approximate Boring Location

Pacific Crest ENGINEERING INC

Site Map Showing Boring Locations - B-1
Scenic Road Sewer Rehabilitation Project
Carmel-By-The-Sea, California

Figure No. 2A
Project No. 2123
Date: 6/10/22



N

0 20 40

Scale: 1 inch = 20 feet

LEGEND:

B-1 Approximate Boring Location

Pacific Crest ENGINEERING INC

Site Map Showing Boring Locations - B-1
Scenic Road Sewer Rehabilitation Project
Carmel-By-The-Sea, California

Figure No. 2A
Project No. 2123
Date: 6/10/22

N

0 20 40

Scale: 1 inch = 20 feet

Base Map: Survey prepared by MNS Engineers

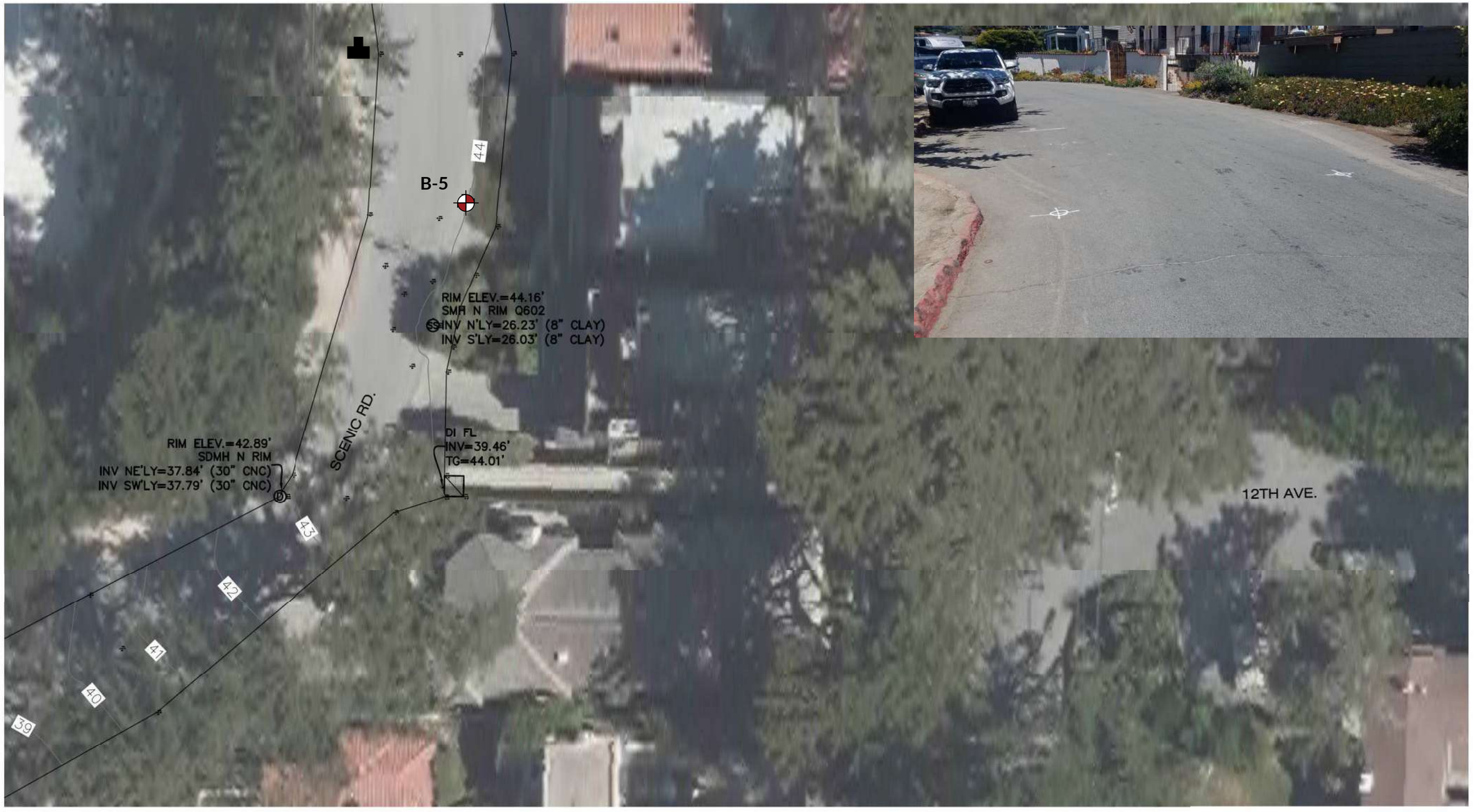
LEGEND:

B-4 ⊕ Approximate Boring Location

Pacific Crest ENGINEERING INC

Site Map Showing Boring Locations - B-3 & B-4
Scenic Road Sewer Rehabilitation Project
Carmel-By-The-Sea, California

Figure No. 2C
Project No. 2123
Date: 6/10/22



Base Map: Survey prepared by MNS Engineers

N

0 20 40

Scale: 1 inch = 20 feet

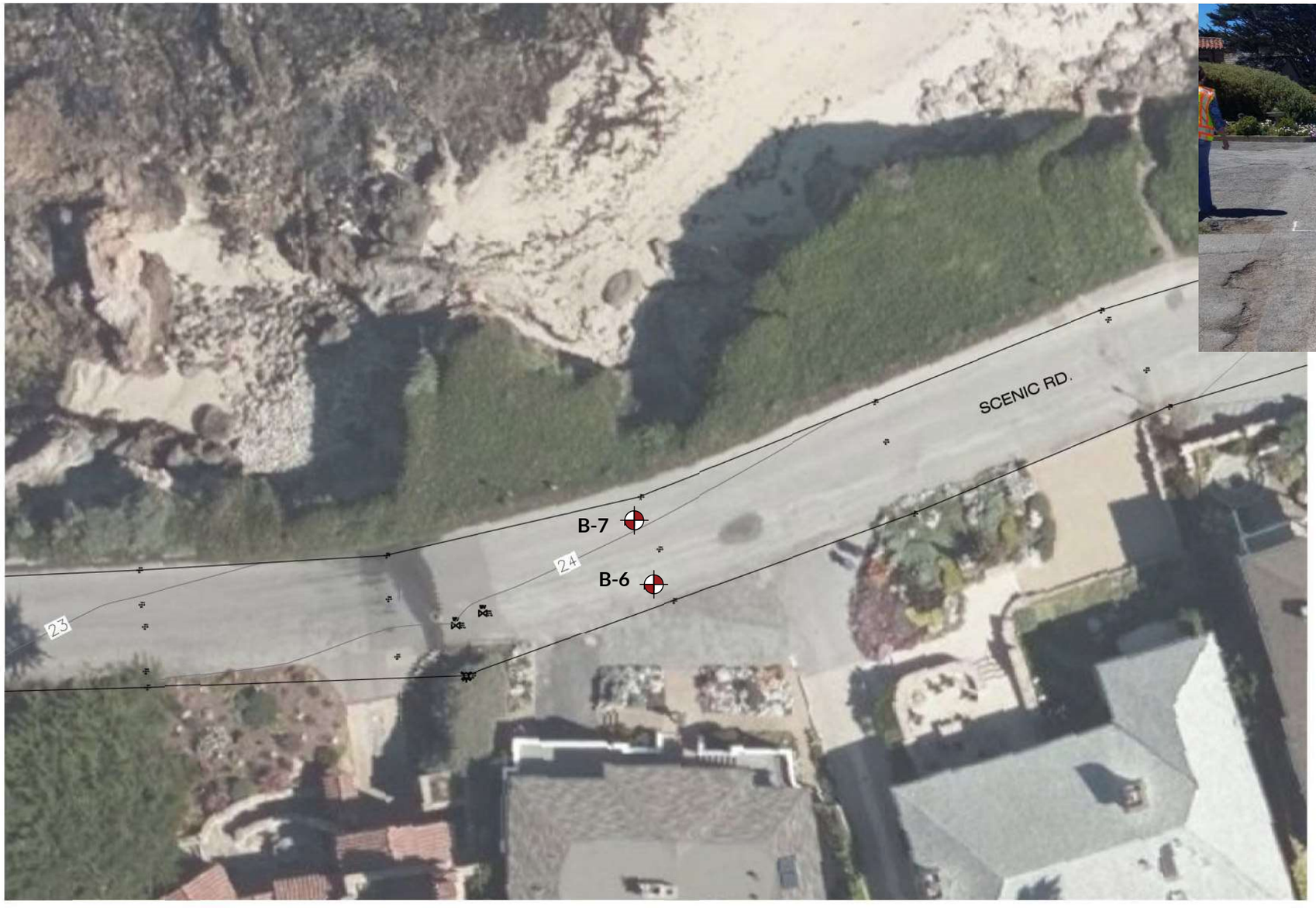
LEGEND:

B-5 Approximate Boring Location

Pacific Crest ENGINEERING INC

Site Map Showing Boring Locations - B-5
Scenic Road Sewer Rehabilitation Project
Carmel-By-The-Sea, California

Figure No. 2D
Project No. 2123
Date: 6/10/22



LEGEND:

B-7 ⊕ Approximate Boring Location

N

0 20 40

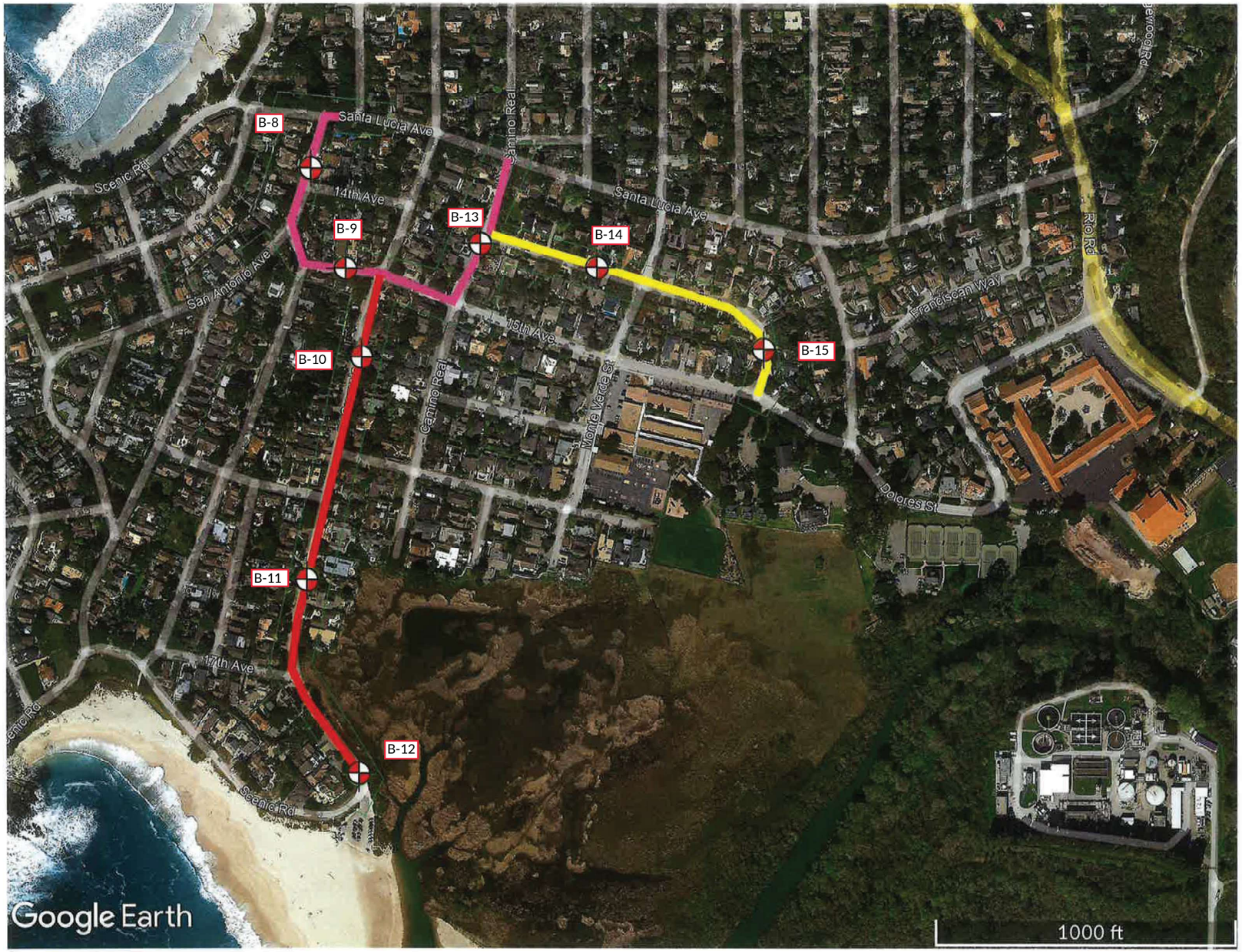
Scale: 1 inch = 20 feet

Base Map: Survey prepared by MNS Engineers

Pacific Crest ENGINEERING INC

Site Map Showing Boring Locations - B-6 & B-7
Scenic Road Sewer Rehabilitation Project
Carmel-By-The-Sea, California

Figure No. 2E
Project No. 2123
Date: 6/10/22



N

LEGEND

- Site 2
- Site 3
- Site 4
- Test Boring Location

Base Map Provided By:
Goolge Earth

Pacific Crest
ENGINEERING INC

Site Map Showing Proposed Test Boring Locations
Scenic Road Sewer Main Rehabilitation Project
Carmel, California

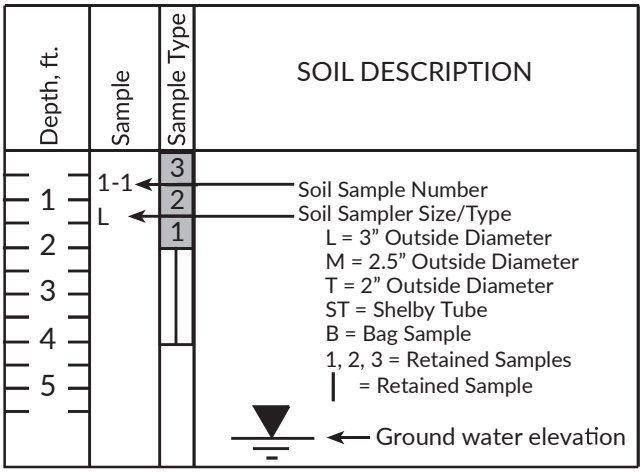
Figure No. 2F
Project No. 2123.1
6/10/2022

KEY TO SOIL CLASSIFICATION - FINE GRAINED SOILS (FGS)
UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2487 (Modi⊠ed)

MAJOR DIVISIONS		SYMBOL	FINES	COARSENESS	SAND/GRAVEL	GROUP NAME
SILT AND CLAY	*LL < 35% Low Plasticity	**CL** Lean Clay PI > 7 Plots Above A Line -OR- **ML** Silt PI > 4 Plots Below A Line	<30% plus No. 200	<15% plus No. 200		Lean Clay / Silt
				15-30% plus No. 200	% sand ≥ % gravel	Lean Clay with Sand / Silt with Sand
					% sand < % gravel	Lean Clay with Gravel / Silt with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Lean Clay / Sandy Silt
					≥ 15% gravel	Sandy Lean Clay with Gravel / Sandy Silt with Gravel
				% sand < % gravel	< 15% sand	Gravelly Lean Clay / Gravelly Silt
					≥ 15% sand	Gravelly Lean Clay with Sand / Gravelly Silt with Sand
		CL - ML 4 < PI < 7	<30% plus No. 200	<15% plus No. 200		Silty Clay
				15-30% plus No. 200	% sand ≥ % gravel	Silty Clay with Sand
					% sand < % gravel	Silty Clay with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Silty Clay
					≥15% gravel	Sandy Silty Clay with Gravel
				% sand < % gravel	< 15% sand	Gravelly Silty Clay
					≥ 15% sand	Gravelly Silty Clay with Sand
	35% ≤ *LL < 50% Intermediate Plasticity	**CI**	<30% plus No. 200	<15% plus No. 200		Clay
				15-30% plus No. 200	% sand ≥ % gravel	Clay with Sand
					% sand < % gravel	Clay with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Clay
					≥ 15% gravel	Sandy Clay with Gravel
				% sand < % gravel	< 15% sand	Gravelly Clay
					≥ 15% sand	Gravelly Clay with Sand
	*LL > 50% High Plasticity	**CH** Fat Clay Plots Above A Line -OR- **MH** Elastic Silt Plots Below A Line	<30% plus No. 200	<15% plus No. 200		Fat Clay or Elastic Silt
				15-30% plus No. 200	% sand ≥ % gravel	Fat Clay with Sand Elastic Silt with Sand
					% sand < % gravel	Fat Clay with Gravel / Elastic Silt with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Fat Clay / Sandy Elastic Silt
					≥ 15% gravel	Sandy Fat Clay with Gravel / Sandy Elastic Silt with Gravel
				% sand < % gravel	< 15% sand	Gravelly Fat Clay / Gravelly Elastic Silt
					≥ 15% sand	Gravelly Fat Clay with Sand / Gravelly Elastic Silt with Sand

* LL = Liquid Limit
* PI = Plasticity Index

BORING LOG EXPLANATION



MOISTURE

DESCRIPTION	CRITERIA
DRY	Absence of moisture, dusty, dry to the touch
MOIST	Damp, but no visible water
WET	Visible free water, usually soil is below the water table

CONSISTENCY

DESCRIPTION	UNCONFINED SHEAR STRENGTH (KSF)	STANDARD PENETRATION (BLOWS/FOOT)
VERY SOFT	< 0.25	< 2
SOFT	0.25 - 0.5	2 - 4
FIRM	0.5 - 1.0	5 - 8
STIFF	1.0 - 2.0	9 - 15
VERY STIFF	2.0 - 4.0	16 - 30
HARD	> 4.0	> 30

Pacific Crest ENGINEERING INC

Boring Log Explanation - FGS
Scenic Road Sewer Rehabilitation
Carmel-by-the-Sea, California

Figure No. 3
Project No. 2123
Date: 6/10/22

KEY TO SOIL CLASSIFICATION - COARSE GRAINED SOILS
UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2487 (Modi□ed)

MAJOR DIVISIONS		FINES	GRADE/TYPE OF FINES	SYMBOL	GROUP NAME *
GRAVEL	More than 50% of coarse fraction is larger than No. 4 sieve size	<5%	Cu ≥ 4 and 1 ≤ Cc ≤ 3	GW	Well-Graded Gravel / Well-Graded Gravel with Sand
			Cu < 4 and/or 1 > Cc > 3	GP	Poorly Graded Gravel/Poorly Graded Gravel with Sand
		5-12%	ML or MH	GW - GM	Well-Graded Gravel with Silt / Well- Graded Gravel with Silt and Sand
				GP - GM	Poorly Graded Gravel with Silt / Poorly Graded Gravel with Silt and Sand
			CL, CI or CH	GW - GC	Well-Graded Gravel with Clay / Well-Graded Gravel with Clay and Sand
				GP - GC	Poorly Graded Gravel with Clay / Poorly Graded Gravel with Clay and Sand
		>12%	ML or MH	GM	Silty Gravel / Silty Gravel with Sand
			CL, CI or CH	GC	Clayey Gravel/Clayey Gravel with Sand
			CL - ML	GC - GM	Silty, Clayey Gravel/Silty, Clayey Gravel with Sand
SAND	50% or more of coarse fraction is smaller than No. 4 sieve size	<5%	Cu ≥ 6 and 1 ≤ Cc ≤ 3	SW	Well-Graded Sand / Well-Graded Sand with Gravel
			Cu < 6 and/or 1 > Cc > 3	SP	Poorly Graded Sand / Poorly Graded Sand with Gravel
		5-12%	ML or MH	SW - SM	Well-Graded Sand with Silt / Well- Graded Sand with Silt and Gravel
				SP - SM	Poorly Graded Sand with Silt / Poorly Graded Sand with Silt and Gravel
			CL, CI or CH	SW - SC	Well-Graded Sand with Clay / Well-Graded Sand with Clay and Gravel
				SP - SC	Poorly Graded Sand with Clay / Poorly Graded Sand with Clay and Gravel
		>12%	ML or MH	SM	Silty Sand / Silty Sand with Gravel
			CL, CI or CH	SC	Clayey Sand / Clayey Sand with Gravel
			CL - ML	SC - SM	Silty, Clayey Sand / Silty, Clayey Sand with Gravel

* The term "with sand" refers to materials containing 15% or greater sand particles within a gravel soil, while the term "with gravel" refers to materials containing 15% or greater gravel particles within a sand soil.

US STANDARD SIEVE SIZE:	3 inch	¾ inch	No. 4	No. 10	No. 40	No. 200	0.002 □m
	COARSE	FINE	COARSE	MEDIUM	FINE		
COBBLES AND BOULDERS	GRAVEL		SAND			SILT	CLAY

RELATIVE DENSITY

DESCRIPTION	STANDARD PENETRATION (BLOWS/FOOT)
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	> 50

MOISTURE

DESCRIPTION	CRITERIA
DRY	Absence of moisture, dusty, dry to the touch
MOIST	Damp, but no visible water
WET	Visible free water, usually soil is below the water table

LOGGED BY CLA | DATE DRILLED 5/24/21 | BORING DIAMETER 6" SS | BORING NO. 1

DRILL RIG CCD Tractor | HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 2½" AB: 3"									
1	1-1 L	3	**SAND WITH SILT:** Yellowish brown (10YR 5/6), fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, slightly moist, medium dense	SP	12			6.2	102.5			
2					17							
		B	**SAND:** White (2.5Y 8/1) and light gray (2.5Y 7/1), fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, clean, dry, medium dense	SP	26	23		0.5				
3	1-2 T				4							
					5							
4			**CLAYEY SAND:** Very dark grayish brown (10YR 3/2), fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, slightly moist, medium dense	SC	6	11		5.3				
	1-3 L				5							
5		2			5			6.0	103.9			0.1% Gravel 84.4% Sand 15.5% Fines
		1	Brown (10YR 4/3), trace coarse to very coarse grains, slightly moist, loose		9	7		5.5	104.4			
6												
7												
8	1-4 T		**SILTY SAND:** Light olive brown (2.5Y 5/3), fine to medium grained with trace coarse to very coarse grains, sub-angular to sub-rounded shaped, poorly graded, micaceous, wet, medium dense	SM	5							
			▼		10							
9					12	22		20.3		24.2		
10												
11												
12	1-5 L		Sand fines slightly with depth, wet, loose		4							
		2			7			25.8				
13		1			8	8		21.3	95.8			
14												
15												
16	1-6 T		Medium to coarse grained with trace very coarse grains, very fine to fine grained from 17 to 17½ feet, wet, medium dense		5							
					7							
17					14	21		23.8				
18			Boring terminated at 17½ feet. Groundwater initially encountered at 8 feet. Measured at 9 feet at the end of drilling activities.									
19												
20												
21												
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Scenic Road Sewer Rehabilitation Project
Carmel-by-the-Sea, California

Figure No. 5
Project No. 2123
Date: 6/10/22

LOGGED BY CLA | DATE DRILLED 5/24/21 | BORING DIAMETER 6" SS | BORING NO. 2

DRILL RIG CCD Tractor | HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 8" AB: 0"									
1	2-1 L	2	**SAND WITH SILT:** Yellowish brown (10YR 5/8), fine grained with trace medium grains, poorly graded, slightly cemented, slightly moist to dry, medium dense	SP	15 17			3.6	94.3			1.4% Gravel 87.5% Sand 11.1% Fines
2		1			25	22		1.6	80.5	14.2		
3	2-2 T		Sample coarsens slightly with depth, dry, loose		3 4							
4					5	9		1.4				1.4% Gravel
5	2-3 L	2	Fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, trace sub-angular shaped siltstone clasts, dry, very loose		3 3			1.7	95.0			87.1% Sand 11.5% Fines
		1			4	4		1.4	96.4			
6												
7												
8	2-4 T		Color change to white (2.5Y 8/1) and light gray (2.5Y 7/1) at 9 feet, clean sand from 9 to 9½ feet, dry, loose		3 3							
9					4	7		3.4				
10			**SAND WITH CLAY:** Black (10YR 2/1), fine to medium grained, sub-angular to sub-rounded shaped, poorly grade, moist, loose	SP								
11												
12	2-5 L	2	**SILTY SAND:** Brown (10YR 5/3), fine to medium grained with trace coarse grains, sub-angular to sub-rounded shaped, poorly graded, slightly moist to dry, very loose	SM	1 2							
13		1			3	3						
14	2-6 T				5							
			SAND WITH SILT: Light olive brown (2.5Y 5/4), fine to medium grained with trace coarse grains, sub-angular to sub-rounded shaped, poorly graded, slightly moist to dry, very loose	SP	1 1	2		2.4	8.1			
15			Boring terminated at 15 feet. No groundwater encountered.									
16												
17												
18												
19												
20												
21												
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Scenic Road Sewer Rehabilitation Project
Carmel-by-the-Sea, California

Figure No. 6
Project No. 2123
Date: 6/10/22

LOGGED BY CLA | DATE DRILLED 5/24/21 | BORING DIAMETER 6" SS | BORING NO. 3

DRILL RIG CCD Tractor | HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 6" AB: 0"									
1	3-1		**SILTY SAND:** Black (10YR 2/1), fine to medium grained with trace coarse grains, sub-angular to sub-rounded shaped, poorly graded, slightly moist, loose	SM	7							
2	L	2			7			5.5	100.2			
		1			8	8		8.7	98.0			
3	3-2		Slightly moist, very loose		2							
	T				2							
4					2	4		6.3		18.8		
	3-3		**SAND WITH SILT:** Brown (10YR 4/3), fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, trace coarse grains, slightly moist, loose	SP	3							
5	L	2			6			4.7	102.2			
		1			8	7		4.3	101.6			
6	3-4		Slightly moist, loose		3							
	T				4							
7					5	9		3.5		11.2		
8	3-5		Yellowish brown (10YR 5/8), fine grained, sub-rounded shaped, poorly graded, clean, slightly moist, medium dense		10							0.0% Gravel
9	L	2			15			6.0	104.5			92.9% Sand
		1			43	30		5.4	103.6			7.1% Fines
10												
11												
12	3-6		Medium grained, sub-rounded shaped, slightly moist, dense		10							
	T				18							
13					20	38		5.8		5.8		
14												
15			Gravelly drilling at 15 feet									13.8% Gravel 47.8% Sand 38.4% Fines
16	3-7	B	▼ **SILTY SAND:** Dark yellowish brown (10YR 4/4), very fine to fine grained, poorly graded, moist, very loose	SM	2			26.7				13.8% Gravel 47.8% Sand 38.4% Fines
	L	2			3		1.5					
17		1	**FAT CLAY:** Dark yellowish brown (10YR 4/4), moist, firm	CH	5	7	1.5	26.7			32	Qu = 2108 psf
18			Boring terminated at 17½ feet. Groundwater initially encountered at 16 feet.									
19												
20												
21												
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Scenic Road Sewer Rehabilitation Project
Carmel-by-the-Sea, California

Figure No. 7
Project No. 2123
Date: 6/10/22

LOGGED BY CLA | DATE DRILLED 5/24/21 | BORING DIAMETER 6" SS | BORING NO. 4

DRILL RIG CCD Tractor | HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 8" AB: 0"									
1	4-1 L		**FILL: SAND WITH GRAVEL:** Black (10YR 2/1), fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, few rootlets, slightly moist, loose	SP	5							24.9% Gravel
2		2			7			7.1	100.7	17.8		70.7% Sand
		1			10	9		5.7	98.0			4.4% Fines
3	4-2 T		Trace oxidation patches, slightly moist, loose		2							
					2							
4					3	5		6.3		15.7		
			Boring terminated at 4 feet. No groundwater encountered.									
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Scenic Road Sewer Rehabilitation Project
Carmel-by-the-Sea, California

Figure No. 8
Project No. 2123
Date: 6/10/22

LOGGED BY CLA | DATE DRILLED 5/24/21 | BORING DIAMETER 6" SS | BORING NO. 5

DRILL RIG CCD Tractor | HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 5" AB: 0"									
1	5-1 L		**SAND WITH SILT:** Dark grayish brown (10YR 4/2), fine grained with trace medium grains, sub-angular to sub-rounded shaped, dry, very loose	SM	3							0.0% Gravel 85.7% Sand 14.3 % Fines
2		1			3							
					4	4		3.1	82.9			
3	5-2 T		Dry, loose		2							
					3							
4					5	8		3.5				
	5-3 L		Trace rounded shaped coarse grains, slightly moist, loose		4							
5		2			8							
		1			10	9						
6												
7												
8			**SANDSTONE BEDROCK WEATHERED TO SAND:** Light yellowish brown (2.5Y 6/4), fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, clean, slightly moist to dry, medium dense	SP								
	5-4 T				5							
9					7							
					12	19		4.5		3.7		
10												
11												
12	5-5 L		Slightly moist to dry, medium dense		6							
		2			20			2.9	93.3			
13		1			35	28		4.1	100.2			
14												
15												
16	5-6 T		**SANDSTONE BEDROCK WEATHERED TO SAND WITH SILT:** Light yellowish brown (2.5Y 6/4), fine grained, poorly graded, clean, slightly moist to dry, very dense	SP	10							
17					50/2"	50/2"		6.1		10.8		
18												
19												
20	5-7 L		Fine to medium grained, slightly moist to dry, very dense		50/6"	50/6"		7.4		13.5		
21			Boring terminated at 20½ feet. No groundwater encountered.									
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Scenic Road Sewer Rehabilitation Project
Carmel-by-the-Sea, California

Figure No. 9
Project No. 2123
Date: 6/10/22

LOGGED BY CLA | DATE DRILLED 5/24/21 | BORING DIAMETER 6" SS | BORING NO. 6

DRILL RIG CCD Tractor | HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 2" AB: 0"									
1	6-1 L		**SAND WITH CLAY:** Black (10YR 2/1), fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, trace sub-rounded to rounded sandstone gravels up to 1 inch in diameter, moist, loose	SP	4							
2		2			5			10.4	98.7			
		1			7	6		9.5	102.9			
3	6-2 T		**SAND WITH SILT:** Brown (10YR 4/3), fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, moist, loose	SP	2							
					2							
4					3	5		9.4				
	6-3 L		**CLAYEY SAND:** Mottled very dark gray (10YR 3/1) and yellowish brown (10YR 5/8), fine to medium grained, sub-rounded shaped, poorly graded, clay exhibits low plasticity, moist, medium dense	SC	10							
5		2			14			14.0	111.8	23.9		Direct Shear:
		1			25	21		13.1	114.1	22.2	11	Cp = 260 psf
6												Φp = 35°
7												Cr = 250 psf
												Φr = 33°
8	6-4 T		**DECOMPOSED GRANITE MECHANICALLY PULVERIZED TO SAND WITH SILT AND GRAVEL:** Gray (5Y 6/1) and white (WHITE 9/N), very fine to fine grained with trace medium to very coarse grains, sub-angular shaped gravels up to ½ inch in diameter, slightly moist, very dense	SP	50/6"	50/6"			6.1			
9												
10												
11												
12	6-5 L		More competent than previous sample, soil coarsens with depth, slightly oxidized, slightly moist, very dense		10							
		2			21			8.5	113.5			
13		1	Slightly coarser than the previous sample, slightly moist, very dense		50/5"	50/5"		10.6	120.4			
	6-6 T				50/2"	50/2"		8.2				
14			Boring terminated at 15 feet. No groundwater encountered.									
15												
16												
17												
18												
19												
20												
21												
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Scenic Road Sewer Rehabilitation Project
Carmel-by-the-Sea, California

Figure No. 10
Project No. 2123
Date: 6/10/22

LOGGED BY CLA DATE DRILLED 5/24/21 BORING DIAMETER 6" SS BORING NO. 7

DRILL RIG CCD Tractor HAMMER TYPE Wireline - Downhole Hammer

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 8" AB: 0"									
1	7-1 L		**FILL: SILTY SAND:** Very dark grayish brown (10YR 3/2) and dark yellowish brown (10YR 4/4), fine to medium grained with trace coarse grains, sub-angular to sub-rounded shaped, poorly graded, slightly moist, medium dense	SM	15							
		2			18			6.9	105.6	23.4		
2		1			20	20		7.0	99.8	23.8		
	7-2 M				3							
		2	Trace sub-angular shaped gravels up to ¼ inch in diameter, slightly moist		5							
3		1			5	8		7.0	98.9	25.0		
	7-3 T		Abalone shell noted in the sample, slightly moist, loose		6							
4					10/DB					24.9		
5			Boring terminated at 4½ feet due to sampler double bouncing. No groundwater encountered.									
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Scenic Road Sewer Rehabilitation Project
Carmel-by-the-Sea, California

Figure No. 11
Project No. 2123
Date: 6/10/22

LOGGED BY CLA | DATE DRILLED 4/20/22 | BORING DIAMETER 6" SS | BORING NO. 8

DRILL RIG CCD - Tractor | HAMMER TYPE 140 lb Downhole with Wireline

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N_{60}" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 2" AB: 7"									
1	8-1 L		**CLAYEY SAND:** Very dark grayish brown (10YR 3/2), fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, trace sub-rounded to well rounded coarse to very coarse sand, moist, medium dense	SC	19							
2		2			25			7.0	115.9			
		1	**SILTY SAND:** Brown (10YR 4/3), fine to medium grained with trace coarse to very coarse grains, sub-angular to sub-rounded shaped, pooelu graded, moist, medium dense	SM	23	25	4.5	6.5	115.0			
3	8-2 T				8							
					13							
4			**CLAYEY SAND:** Dark brown (7.5YR 3/3), fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, few sub-angular shaped coarse to very coarse grained sand, moist, medium dense	SC	15	28		5.9				
	8-3 L				8							
5		2			10							
		1	Slight increase in coarsness of sand, trace coarse to very coarse grained sand, moist, medium dense		12	12		7.6	109.0	17.9		
6												
7												
8			**SAND:** Brownish yellow (10YR 6/6), fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, slightly moist, medium grained	SP	4							
	8-4 T				4							
9					8	12		4.5				
10												
11												
12												
	8-5 L		Light gray (10YR 7/2), medium to coarse grained with trace amounts of fine grains, sub-angular to sub-rounded shaped, poorly graded, dry, medium dense		8							
13		B			22			3.2				
		1			36	30		2.5	106.4			
	8-6 T		Medium grained, poorly graded, sub-angular to rounded shaped, dry, dense		9							
14					16							
15					26	30		2.9				
			Boring terminated at 15 feet. No groundwater encounterd.									
16												
17												
18												
19												
20												
21												
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Scenic Rd Sewer Main Rehabilitation Project
Carmel, California

Figure No. 12
Project No. 2123
Date: 6/10/22

LOGGED BY CLA | DATE DRILLED 4/20/22 | BORING DIAMETER 6" SS | BORING NO. 9

DRILL RIG CCD - Tractor | HAMMER TYPE 140 lb Downhole with Wireline

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N_{60}" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 2" AB: 10" (baserock mixed with native)									
1	9-1 L		**CLAYEY SAND:** Dark yellowish brown (10YR 4/4), fine grained with trace medium and coarse grains, poorly graded, micaceous, moist, medium dense	SC	15							
2		2			18			9.7	108.1			
		1			19	19		9.8	108.4	15.4		
3	9-2 T		Moist, loose		8							
					6							
4					4	10		9.8				
	9-3 L	B	Fine to medium grained with trace coarse grains, sub-angular to rounded shaped, poorly graded, moist, medium dense		8							
5		2			24							
		1			12	19		9.4	108.3			
6												
7												
8	9-4 T		Slight increase in clay content, slight decrease in coarseness of sand, fine grained, moist, medium dense		8							
9					10							
					12	22		12.1				
10												
11												
12	9-5 L	2	**WEATHERED SANDSTONE BEDROCK:** Described as **SILTY SAND**, very fine to fine grained, poorly graded, massive, friable, slightly moist, very dense	SM	22			16.1	100.4			
		1			50/3"	50/3"		16.6	106.6			
13	9-6 T		"Poker chipped", mechanically broken, slightly moist, very dense		50/4"	50/4"		15.5				
14			Boring terminated at 13½ feet. No groundwater encounterd.									
15												
16												
17												
18												
19												
20												
21												
22												
23												

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Log of Test Borings
Scenic Rd Sewer Main Rehabilitation Project
Carmel, California

Figure No. 13
Project No. 2123
Date: 6/10/22

LOGGED BY JP | DATE DRILLED 4/20/22 | BORING DIAMETER 6" SS | BORING NO. 10

DRILL RIG CCD - Tractor | HAMMER TYPE 140 lb Downhole with Wireline

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N_{60}" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 2" AB: 7"									
1	10-1 L		**SILTY SAND:** Very dark grayish brown (10YR 3/2), very fine to fine grained with trace medium grains throughout, poorly graded, dry to moist, loose	SM	4							
2		2			5			5.8	106.7			
		1			8	7		6.2	103.4			
3	10-2 T		Dry to moist, very loose		3							
					3							
4					2	5		5.2				
	10-3 L				5							
		2	**SAND:** Light gray (10YR 7/2), very fine to fine grained,	SP	5			5.1	105.7			
5		1	poorly graded, sub-angular to sub-rounded shaped, dry, loose		6	6		5.0	104.9			
6												
7												
			CLAYEY SAND: Pale brown (10YR 6/3), fine to coarse	SC								
8	10-4 T		grained, sub-angular to sub-rounded shaped, poorly graded, moist, medium dense		11							
9					14							
					16	30		8.9		13.7		
10												
11												
12	10-5 L	2	Increase in clay, medium to coarse grained, poorly graded, wet, dense		22			16.4	109.6			
		1			50/5"	50/5"		16.3	108.7			
13	10-6 T				20							
					26							
14			**WEATHERED SANDSTONE BEDROCK:** Described as	SM	44	70		15.4				
15			**SILTY SAND**, very fine to fine grained, poorly graded, friable, dry to moist, dense									
			Boring terminated at 14½ feet.									
16			No groundwater encounterd.									
17												
18												
19												
20												
21												
22												
23												

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Log of Test Borings
Scenic Rd Sewer Main Rehabilitation Project
Carmel, California

Figure No. 14
Project No. 2123
Date: 6/10/22

LOGGED BY CLA | DATE DRILLED 4/20/22 | BORING DIAMETER 6" SS | BORING NO. 11

DRILL RIG CCD - Tractor | HAMMER TYPE 140 lb Downhole with Wireline

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N_{60}" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 2" AB: 4"									
1	11-1 L		**CLAYEY SAND:** Very dark grayish brown (10YR 3/2), fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, trace coarse, moist, loose	SC	3							
2		2			5			9.2	104.6			
		1			6	6		9.7	101.8			
3	11-2 T		Dark yellowish brown (10YR 4/4), fine grained with trace medium to coarse grains, poorl graded, moist, loose		2 3							
4					6	9		7.4				
	11-3 L		Slight increase in coarseness of sand, very moist, loose		5							
5		B			6							
		1			9	8		8.7	114.6			
6												
7												
8	11-4 T		Increase in coarseness of sand at 9 feet, medium to coarse grained, sub-angular to sub-rounded shaped, poorly graded, micaceous, yellowish brown (10YR 5/8), wet, dense, (DG?)		15							
9					21							
					23	44		10.3				
10												
11			▽									
12	11-5 L		**CLAYEY SAND WITH GRAVEL:** Stong brown (7.5YR 4/6), and light gray (10YR 7/1), fine to coarse grained with trace very coarse grained, sub-angular to well rounded gravel up to 2 inches in diameter, wet, very dense	SC	20							17.6% Gravel 64.0% Sand 18.5% Fines
13		2			26			15.8	118.2			
	11-6 T	1			40	34		14.5	115.2	18.5		
14			Wet, very dense		50/4"	50/4"		8.4				
			Boring terminated at 14 feet. Groundwater encounterd at 11 feet.									
15												
16												
17												
18												
19												
20												
21												
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Scenic Rd Sewer Main Rehabilitation Project
Carmel, California

Figure No. 15
Project No. 2123
Date: 6/10/22

LOGGED BY JP | DATE DRILLED 4/20/22 | BORING DIAMETER 6" SS | BORING NO. 12

DRILL RIG CCD - Tractor | HAMMER TYPE 140 lb Downhole with Wireline

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N_{60}" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 2" AB: 6"									
1	12-1 L		**SILTY SAND:** Very dark gray (10YR 3/1), fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, dry to moist, loose	SM	4							
2		2			7			7.5	89.4			
		1			4	6		6.0	96.5			
3	12-2 T		Moist, medium dense		6							
			Driller noted increase in resistance at 3½ feet		8							
4					11	19		12.0		26.6		
	12-3 L	2			11			11.6	93.4			
5		1	**MONTEREY FORMATION:** Defined as **CLAYEY SAND**, fine to coarse grained, sub-angular to sub-rounded shaped, dry to moist, dense	SC	50/6"	50/6"		13.2	94.4			
6												
7	12-4 T		Very hard drilling conditions, auger advanced ¼ inch in 5 minutes at 7 feet Moist, dense		50/½"	50/½"		11.3				
8			Boring terminated at 7½ feet. No groundwater encounterd.									
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Scenic Rd Sewer Main Rehabilitation Project
Carmel, California

Figure No. 16
Project No. 2123
Date: 6/10/22

LOGGED BY CLA | DATE DRILLED 4/20/22 | BORING DIAMETER 6" SS | BORING NO. 13

DRILL RIG CCD - Tractor | HAMMER TYPE 140 lb Downhole with Wireline

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N_{60}" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 2" AB: 3"									
1	13-1 L		**SILTY SAND:** Very dark brown (10YR 2/2), very fine to fine grained with trace medium to coarse grains, poorly graded, moist, loose	SM	3							
2		2			5			8.0	98.1			
		1			7	6		7.9	100.3			
3	13-2 T		Moist, loose		3							
					4							
4					4	8		7.7				
	13-3 L		Dark yellowish brown (10YR 3/4), slight decrease in silt content, moist, loose		5							
5		2			7			7.6	104.6			
		1			9	8		7.9	102.4			
6												
7												
8			**SAND:** Brownish yellow (10YR 6/6), fine to medium grained with trace very fine and trace coarse grains, sub-angular to sub-rounded shaped, poorly graded, few sub-angular shaped quartz gravels up to ⅜" in diameter, slightly moist to dry, medium dense	SP								
	13-4 T				6							
9					8							
					8	16		5.8		4.5		
10												
11												
12												
	13-5 L		Slightly moist, dense		18							
13		2			30			5.5	101.5			
		1			32	32		5.2	105.2			
14	13-6 T		Slightly moist, very dense, (lack of gravels)		15							
					32							
15					50/5"	50/5"		5.0				
			Boring terminated at 15 feet. No groundwater encounterd.									
16												
17												
18												
19												
20												
21												
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Scenic Rd Sewer Main Rehabilitation Project
Carmel, California

Figure No. 17
Project No. 2123
Date: 6/10/22

LOGGED BY JP | DATE DRILLED 4/20/22 | BORING DIAMETER 6" SS | BORING NO. 14

DRILL RIG CCD - Tractor | HAMMER TYPE 140 lb Downhole with Wireline

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N_{60}" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 2½" AB: 3½"									
1	14-1 L		**CLAYEY SAND:** Strong brown (7.5YR 5/6), fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, moist, loose	SC	3							
2		2			6			6.8	105.3			
		1			6	6		7.7	107.6			
3	14-2 T		Moist, very loose		3							
					2							
4					2	4		9.8				
	14-3 L		Yellowish brown (10YR 5/6), medium grained, poorly graded, moist, loose		3							
5		2			6			8.1	108.2			
		1			6	6		11.3	112.0			
6												
7												
8	14-4 T				20							
					32							
9			**CLAYEY SAND:** Gray (10YR 5/1), poorly graded, fine grained, intermediate plasticity, moist, dense	SC	18	50		12.9				
10												
11												
12	14-5 L		Trace gravels, iron oxide staining throughout, mosit, very dense		15							
		2			32		4.5	18.3	109.3	41.1		Qu = 7.58 ksf
13		1			48	52	4.0	12.6	117.7		18	
	14-6 T				16							
14					20		4.0					
					28	48	4.5	12.6				
15			Boring terminated at 15 feet. No groundwater encounterd.									
16												
17												
18												
19												
20												
21												
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Scenic Rd Sewer Main Rehabilitation Project
Carmel, California

Figure No. 18
Project No. 2123
Date: 6/10/22

LOGGED BY JP | DATE DRILLED 4/20/22 | BORING DIAMETER 6" SS | BORING NO. 15

DRILL RIG CCD - Tractor | HAMMER TYPE 140 lb Downhole with Wireline

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N_{60}" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
			AC: 2" AB: 4"									
1	15-1 L		**CLAYEY SAND:** Dark gray (10YR 4/1), very fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, dry to moist, medium dense	SC	5							
2		2			8			6.2	108.5			
		1			20	15		7.1	111.9			
3	15-2 T		Clay content increases with depth, moist, dense		11							
					30							
4					33	63		11.0				
	15-3 L	2	Moist, dense		22							
5		1			50/6"	50/6"		8.6	111.3			
6												
7												
8			**CLAYEY SAND:** Dark yellowish brown (10YR 4/6) and very dark greenish gray (GLEY1 3/1), very fine grained to fine grained, poorly graded, moist, very dense.	SC								
	15-4 T				17							
9					23							
					32	55		11.5		48.9	15	
10												
11												
12	15-5 L	2			20			14.3	109.9			
		1	**SILTY SAND:** Dark greenish gray (GLEY1 3/1), fine to medium grained, sub-angular to sub-rounded shaped, poorly graded, micaceous, moist, dense	SM	50/6"	50/6"		11.8	106.3			
13												
	15-6 T				18							
14					27							
			Boring terminated at 14½ feet. No groundwater encounterd.		36	63		12.8				
15												
16												
17												
18												
19												
20												
21												
22												
23												

Pacific Crest ENGINEERING INC

Log of Test Borings
Scenic Rd Sewer Main Rehabilitation Project
Carmel, California

Figure No. 19
Project No. 2123
Date: 6/10/22

Corrosivity Test Summary

CTL # 416-633 Date: 7/7/2021 Tested By: PJ Checked: PJ
Client: Pacific Crest Engineering Project: Scenic Proj. No: 2123
Remarks:

Sample Location or ID			Resistivity @ 15.5 °C (Ohm-cm)			Chloride	Sulfate		pH	ORP	Moisture	Soil Visual Description
Boring	Sample, No.	Depth, ft.	As Rec.	Minimum	Saturated	mg/kg	mg/kg	%		(Redox)	At Test	
						Dry Wt.	Dry Wt.	Dry Wt.		mv	%	
			ASTM G57	Cal 643	ASTM G57	Cal 422-mod.	Cal 417-mod.	Cal 417-mod.	Cal 643	SM 2580B	ASTM D2216	
2-5-1		-	-	4304	-	99	594	0.0594	7.9	-	2.1	Yellowish Brown Silty SAND
2-5-2		-	-	3192	-	94	600	0.0600	7.8	-	2.3	Yellowish Brown Silty SAND
5-3-1		-	-	1637	-	376	376	0.0116	7.8	-	5.2	Yellowish Brown Silty SAND
5-3-2		-	-	2075	-	255	255	0.0037	7.7	-	4.4	Yellowish Brown Silty SAND

Resistivity	Ohm-cm
Very Corrosive	0-1000
Corrosive	1,000-2,000
Fairly Corrosive	2,000-5,000
Mildly Corrosive	5,000-10,000
Negligible	>10,000

Chloride Concentration	mg/kg
Severe	>1,500
Positive	300-1,500
Negligible	0-300

Sulfate Concentration	mg/kg
Severe	>5,000
Considerable	2,000-5,000
Positive	1,000-2,000
Negligible	0-1,000

pH	
Potential for acid attack on concrete and steel	<5.5

Corrosivity Test Summary

CTL #	416-667	Date:	5/6/2022	Tested By:	PJ	Checked:	PJ
Client:	Pacific Crest Engineerin	Project:	Scenic			Proj. No:	2123
Remarks:							

Sample Location or ID			Resistivity @ 15.5 °C (Ohm-cm)			Chloride	Sulfate		pH	ORP	Moisture	
Boring	Sample, No.	Depth, ft.	As Rec.	Minimum	Saturated	mg/kg	mg/kg	%		(Redox)	At Test	Soil Visual Description
						Dry Wt.	Dry Wt.	Dry Wt.		mv	%	
			ASTM G57	Cal 643	ASTM G57	Cal 422-mod.	Cal 417-mod.	Cal 417-mod.	Cal 643	SM 2580B	ASTM D2216	
9-3-2	-	-	-	5027	-	12	164	0.0164	7.3	-	4.1	Dark Yellowish Brown SILT w/ Sand & Gravel
11-3-2	-	-	-	6569	-	29	99	0.0099	6.9	-	2.1	Reddish Brown SILT w/ Sand
15-3-2	-	-	-	6340	-	10	24	0.0024	7.0	-	2.8	Olive Brown SILT w/ Sand

Resistivity	Ohm-cm
Very Corrosive	0-1000
Corrosive	1,000-2,000
Fairly Corrosive	2,000-5,000
Mildly Corrosive	5,000-10,000
Negligible	>10,000

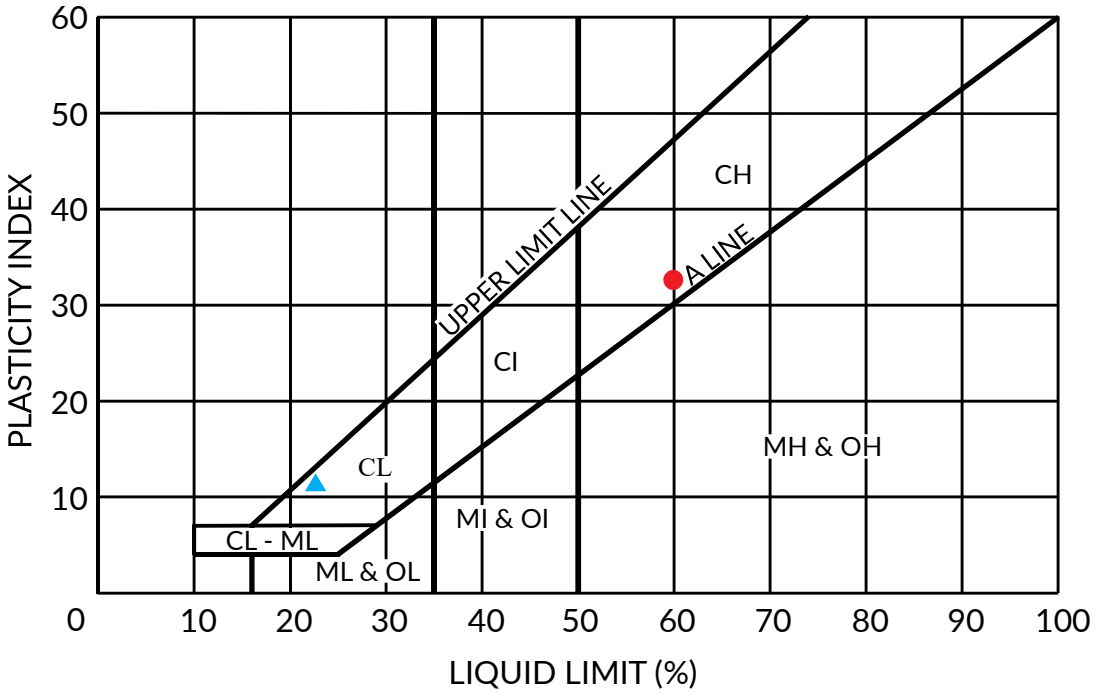
Chloride Concentration	mg/kg
Severe	>1,500
Positive	300-1,500
Negligible	0-300

Sulfate Concentration	mg/kg
Severe	>5,000
Considerable	2,000-5,000
Positive	1,000-2,000
Negligible	0-1,000

pH	
Potential for acid attack on concrete and steel	<5.5

ATTERBERG LIMITS - ASTM D4318

PLASTICITY CHART



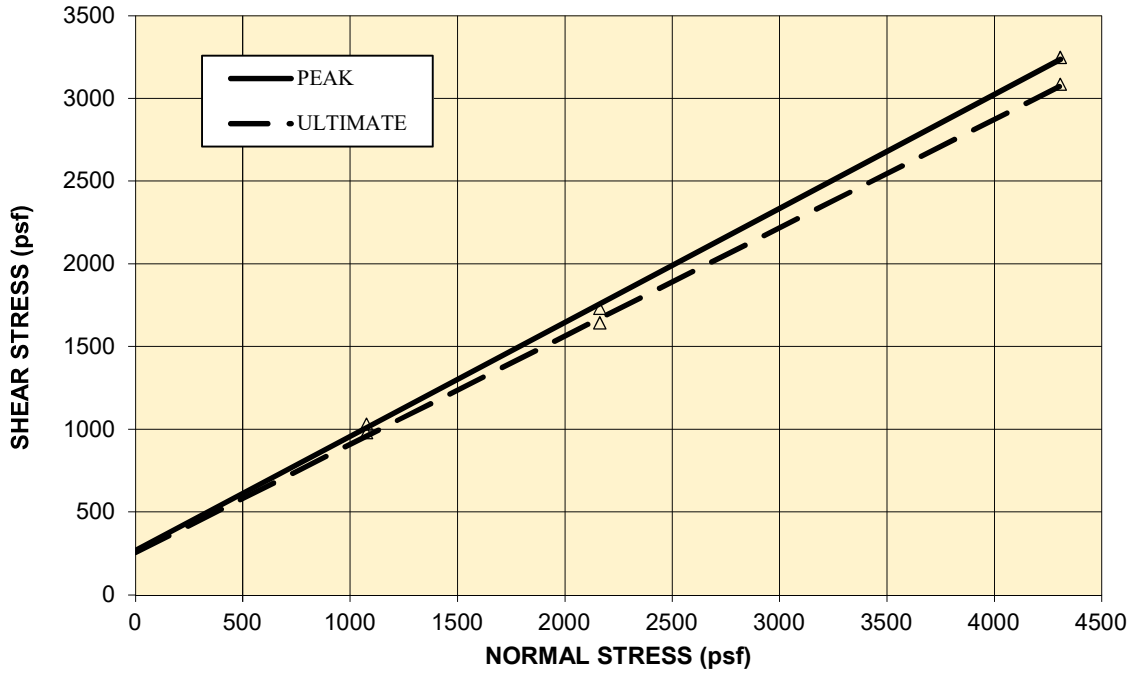
*This chart has been modi☒ed to include the intermediate classi☒cations CI, MI and OI for clays and silts with liquid limits between 35 and 50.

SYMBOL	SAMPLE #	LL (%)	PL (%)	PI
●	**3-7-1**	**60**	**28**	**32**
▲	**6-3-1**	**22**	**12**	**11**

Pacific Crest ENGINEERING INC	**Atterberg Limits** Scenic Road Sewer Rehabilitation Carmel-by-the-Sea, California	Figure No. 21 Project No. 2123 Date: 6/10/22

DIRECT SHEAR TEST - ASTM D3080

Direct Shear Test for Soils Under Consolidated Drained Conditions



				Φ	C (psf)
SAMPLE:	6-3-2	USCS:	PEAK	35	260
SOIL TYPE:	SAND WITH SILT AND GRAVEL		ULTIMATE	33	250

Initial Sample Data:

Sample:	A	B	C	
Sample Diameter (in):	2.41	2.41	2.41	
Initial Sample Height (in):	1.000	1.000	1.000	
Wet Density (pcf):	119.7	116.9	121.6	
Moisture (%):	14.1%	18.0%	19.3%	
Dry Density (pcf):	104.9	99.1	102.0	
Void Ratio:	0.61	0.70	0.65	
% Saturation:	62.9%	69.2%	79.7%	

Sample Data At Test:

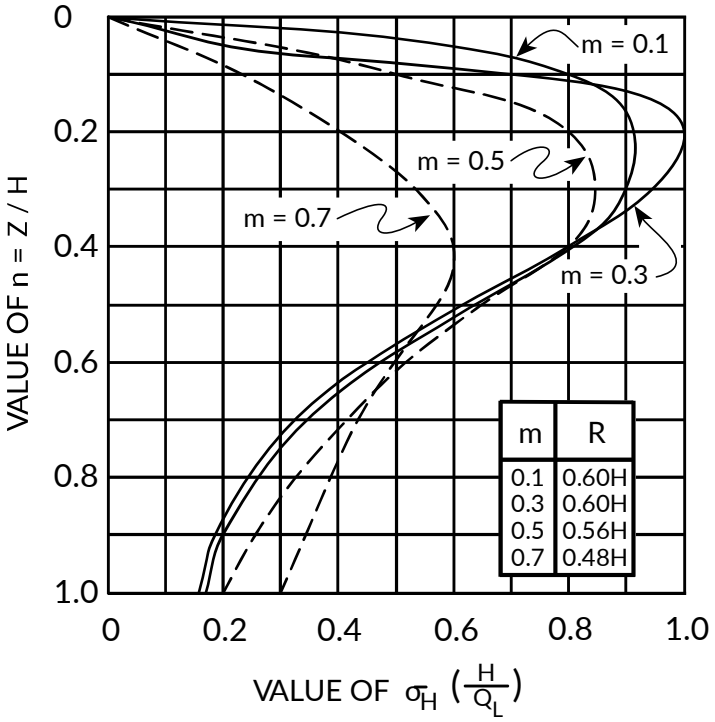
Normal Stress (psf):	1077	2163	4307	
Sample Height at Test (in):	0.997	0.991	0.990	
Wet Density (pcf):	125.9	125.1	126.7	
Moisture (%):	18.7%	24.1%	22.0%	
Dry Density (pcf):	106.1	100.8	103.9	
Void Ratio:	0.59	0.67	0.62	
% Saturation:	85.7%	96.9%	95.5%	
Strain Rate (in/min):	0.0020	0.0020	0.0020	
Peak Shear Stress (psf):	1030	1729	3246	
Ultimate Shear Stress (psf):	979	1643	3084	

Pacific Crest ENGINEERING INC

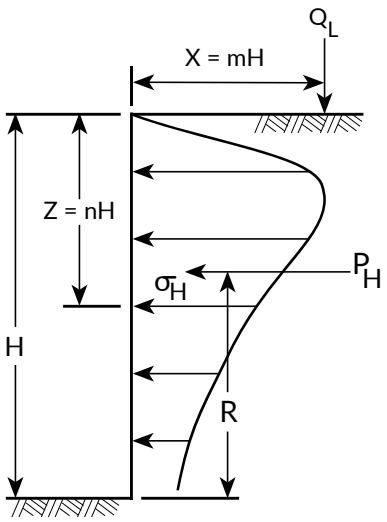
Direct Shear Test Results
Scenic Road Sewer Rehabilitation Project
Carmel-by-the-Sea, California

Figure No. 22
Project No. 2123
Date: 6/10/22

LINE LOAD



m	R
0.1	0.60H
0.3	0.60H
0.5	0.56H
0.7	0.48H



FOR $m \leq 0.4$:

$$\sigma_H \left(\frac{H}{Q_L}\right) = \frac{0.20\,n}{(0.16 + n^2)^2}$$

$$P_H = 0.55 Q_L$$

FOR $m > 0.4$:

$$\sigma_H \left(\frac{H}{Q_L}\right) = \frac{1.28\,m^2 n}{(m^2 + n^2)^2}$$

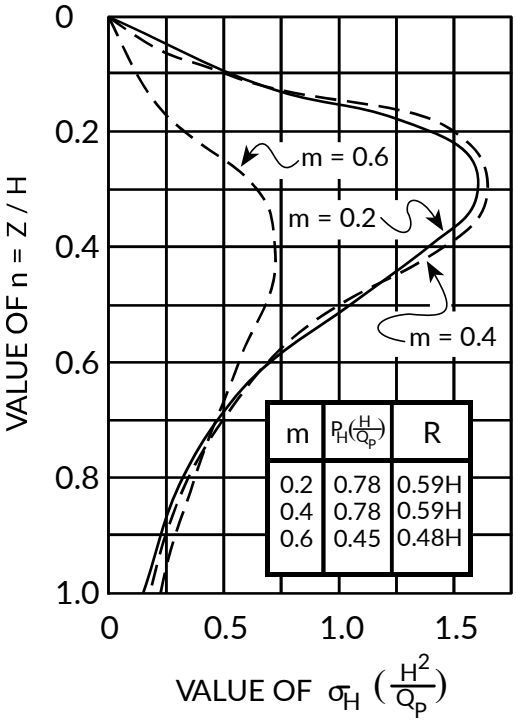
RESULTANT $P_H = \frac{0.64 Q_L}{(m^2 + 1)}$

PRESSURES FROM LINE LOAD Q_L

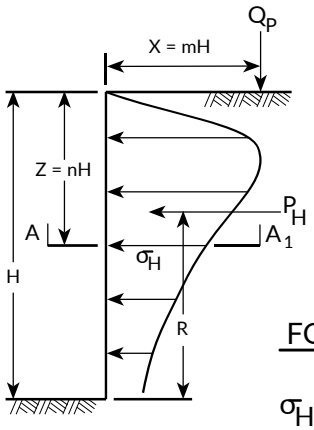
(BOUSSINESQ EQUATION MODIFIED BY

REFERENCE: Design Manual
NAVFAC DM-7.02
Figure 11
Page 7.2-74

POINT LOAD



m	$P_H\left(\frac{H}{Q_P}\right)$	R
0.2	0.78	0.59H
0.4	0.78	0.59H
0.6	0.45	0.48H



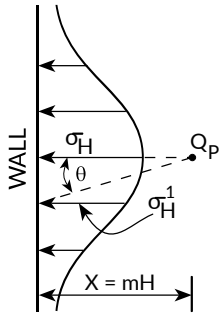
FOR $m \leq 0.4$:

$$\sigma_H \left(\frac{H^2}{Q_P}\right) = \frac{0.28\,n^2}{(0.16 + n^2)^3}$$

FOR $m > 0.4$:

$$\sigma_H \left(\frac{H^2}{Q_P}\right) = \frac{1.77\,m^2 n^2}{(m^2 + n^2)^3}$$

$$\sigma_H^1 = \sigma_H \cos^2(1.1\,q)$$



SECTION A-A_1

PRESSURES FROM POINT LOAD Q_P

(BOUSSINESQ EQUATION MODIFIED

APPENDIX B

General Pipe Bursting Guidelines

PIPE BURSTING GRAVITY SEWER MAINS WITH HDPE PIPE

SUGGESTED STANDARD SPECIFICATION

January, 2012

Prepared by
International Pipe Bursting Association

Thanks to the following participants for the development of this document:
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Disclaimer

These specifications were prepared by NASSCO and peer reviewed by industry professionals. These specifications are not specific to any one product and should be considered a guideline only. Conditions for use may require additions, deletions or amendments to these guidelines so as to conform to project specific site conditions. NASSCO assumes no liability as to content, use and application of these guidelines.

Index

PART 1 - GENERAL

A. The following supplemental sewer main specifications are intended to address the installation of high-density polyethylene pipe for sewer main using pipe bursting methods and technology for sanitary sewer lines.

1.1 DEFNITIONS

A. Pipe Bursting: Method of trenchless construction in which a bursting tool splits/fractures the existing pipe while simultaneously installing a new Polyethylene Pipe of the same size or larger using a Static or Pneumatic Pipe Bursting Technique.

B. Engineer: Overall project engineer employed or retained by the municipal utility authority or private collection system owner.

C. Project Owner: Municipal utility authority, sewer district or private owner of the sewer system.

D. Contractor: Firm engaged in the construction of underground utility lines and with demonstrated competency using pipe bursting methods for the installation of sewer pipelines.

1.2 SCOPE

A. This specification addresses the installation of sewer mains by the pipe bursting method, including connecting to existing sewer mains, connecting to existing services or installing house connections. The Contractor will furnish all labor, equipment, materials, tools and appurtenances necessary or proper for the performance and completion of the contract. Inspection and payment will be by the method stipulated in the contract.

1.3 QUALIFICATIONS

A. The Pipe Bursting Contractor will have actively engaged in the installation of pipe using pipe bursting for a minimum of three (3) years and have installed, as a company, a minimum of 50,000 feet in similar conditions.

B. Field Supervisory Personnel employed by the Pipe Bursting Contractor will have at least (3) three years of documented experience in the performance of the work and tasks as stated in the contract documents.

1.4 SUBMITTAL

A. The Contractors shall submit the following:

1. Documentation showing that personnel has three (3) years of Pipe Bursting experience with a list of a minimum 50,000 LF installed by the company including 3 sewer main projects similar or greater in scope and value to the project specified in the contract documents. Information for each supervisor and the company must include, but not be limited to, date of work, location, pipe information (i.e., length, diameter, depth of installation, pipe material, etc.), project owner information, (i.e., name, address, and telephone number, contact person).
2. Drawings and documents:
    a. Shop drawings, catalog data, and manufacturer's technical data showing complete information on material composition, physical properties, and dimensions of new pipe and fittings. Include manufacturer's recommendations for handling, storage, and repair of pipe and fittings damaged.
    b. Certifications of personnel involved in Butt Fusion Welding.

PART 2 - MATERIALS

2.1 HDPE PIPE

A. Polyethylene Plastic Pipe shall be High Density Polyethylene Pipe (HDPE) and meet applicable requirements of ASTM F714.

B. HDPE pipe and fittings will be used in accordance with the material specifications. All additional appurtenances (manholes, tees, gaskets, etc.) will meet the material specifications. All pipe installed by pipe bursting will be joined by butt fusion, electro fusion, or full circle repair clamp as detailed in paragraph B (Pipe Joining) of this section.

C. HDPE pipe will be produced from resins meeting the requirements of ASTM D1248, designation PE3408, ASTM D3350 cell classification PE345444C, and will meet the requirements of AWWA C901 and C906. HDPE pipe will meet the minimum stability requirements of ASTM D3350. Pipe will be legibly marked at intervals of no more than five feet with the manufacturer's name, trademark, pipe size, HDPE cell classification, appropriate legend such as SDR 19 or SDR 17, ASTM D3035, AWWA C901 or C906, date of manufacture and point of origin.

D. All pipe shall be made of virgin material. No rework material except that obtained from the manufacturers own production of the same formulation shall be used.

E. The pipe shall be homogeneous throughout and shall be free of visible cracks, holes, foreign material, blisters, or other deleterious faults.

F. Pipe color shall be solid black unless otherwise specified in these contract documents.

G. HDPE Pipe shall be Iron Pipe Size (IPS) unless otherwise specified in these contract documents.

H. Dimension Ratios: The minimum wall thickness of the HDPE pipe shall meet the following;

Minimum DR
DR 19 or DR 17

2.2 PIPE JOINING FOR TERMINAL SECTIONS OF HDPE PIPE

A. The polyethylene pipe shall be assembled and joined at the site using the butt-fusion method to provide a leak proof joint. Threaded or solvent-cement joints and connections are not permitted. All equipment and procedures used shall be in strict compliance with the manufacturer's recommendations. Fusing shall be accomplished by personnel certified as fusion technicians by a manufacturer of polyethylene pipe and/or fusing equipment.

B. Terminal sections may also be joined by Electrofuse Couplings by Central Plastic Company, Friatec, or approved equal.

C. Terminal sections may also be joined by Full Circle Repair Clamps by Smith Blair, JCM, or approved equal.

2.3 MATERIALS RELATED TO SEWER SERVICE CONNECTIONS

A. Sewer service connections to the HDPE main may be made by Plastic Saddles with Stainless Steel Straps, by GPK or approved equal or Rubber Saddles with Stainless Steel Straps by Fernco Company, DFW, or approved equal.

B. Sewer service connections to the main may also be made with Electrofusion Saddles by Central Plastics, Friatec, or approved equal.

C. Sewer service connections to the main may also be made with Inserta Tees by Fowler Manufacturing.

2.4 MATERIALS FOR SEALING MANHOLES

A. The annular space at each manhole may be sealed with Oakum saturated with Avanti 202 or approved equal and covered with a quick setting grout.

B. The annular space at each manhole may also be sealed with a water stop gasket by Fernco Company or approved equal and finished with a quick setting grout.

PART 3 - EQUIPMENT

A. The pipe bursting unit shall be designed and manufactured to force its way through the existing line by fracturing the pipe and compressing the broken pieces into the surrounding soil as the equipment progresses. The bursting unit shall generate sufficient force to burst and compact the existing pipeline. In each case the pipe bursting unit shall pull the polyethylene pipe with it as it moves forward.

PART 4 - EXECUTION

4.1 GENERAL

A. Bypass Pumping shall be accomplished when and where necessary. The Contractor shall provide flow diversion with pumps adequate in size and capacity to handle all flows generated during the pipe burst process. All costs for bypass pumping shall be incidental unless specific pay items for this work are included in the pay schedule.

B. Excavation of insertion pits shall be at locations determined by the Contractor.

C. Insertion pits shall be of sufficient length to allow the bursting head and new HDPE pipe to enter the host pipe at an angle that will maintain the grade of the existing sanitary sewer.

4.2 PREPARATION

A. All sewer service connections shall be located prior to pipe bursting the main by PACP Pre-CCTV Inspection.

B. If the PACP Pre-CCTV inspection reveals obstructions or pipe materials that will prevent the existing pipe from being pipe burst properly and cannot be removed by conventional cleaning equipment, a point repair will be made by the Contractor, with approval from the Owner/Engineer. Separate payment for this work will be made and it is not considered incidental to the pipe bursting process.

C. If the PACP Pre-CCTV inspection reveals a sag or hump, a sag or hump removal will be made by the Contractor, with approval from the Owner/Engineer. Separate payment for this work will be made and it is not considered incidental to the pipe bursting process.

D. Before any excavation is done for any purposes, the Contractor shall contact the appropriate One Call agency for determining field locations of existing utilities.

4.3 INSERTION OF THE HDPE PIPE

A. The polyethylene pipe shall be assembled and joined at the site using the butt-fusion method to provide a leak proof joint. Threaded or solvent-cement joints and connections are not permitted. All equipment and procedures used shall be in compliance with the manufacturer's recommendations. Fusing shall be accomplished by personnel certified as fusion technicians by a manufacturer of HDPE pipe and/or fusing equipment.

B. The butt-fused joint shall be in true alignment and shall have uniform rollback beads resulting from the use of proper temperature and pressure. The joint shall be allowed adequate cooling time before removal of pressure. The fused joint shall be watertight and shall have tensile strength equal to that of the pipe. All defective joints shall be cut out and replaced at the expense of the Contractor.

C. Service connections to the HDPE pipe shall be made with materials submitted and approved in accordance with Paragraph 2. Materials.

D. An appropriate relaxation period shall be allowed prior to making service connections and connecting to manholes. The relaxation period shall be appropriate with and dependent upon site conditions, as determined by Contractor.

E. If concrete encasements are encountered, a point repair shall be performed to excavate and break out concrete prior to the bursting operation to allow the steady and free passage of the pipe bursting head, with approval from the Owner/Engineer. Separate payment for this work will be made and it is not considered incidental to the pipe bursting process.

F. The new HDPE pipe shall be inserted immediately behind the bursting head in accordance with the manufacturer's recommended procedures. The bursting tool shall be specifically designed and manufactured for the type of insertion process being used. It shall be utilized to guide and assist the bursting head during the operation. A pushing machine may be utilized to aid pipe insertion from the rear.

G. New HDPE pipe shall extend a minimum of 6" into each manhole. The annular space shall be sealed at each manhole with Oakum saturated with Avaniti 202 or a Water Stop Gasket (as described in Paragraph 2) and finished with a quick setting grout.

4.4 SERVICE RECONNECTIONS

A. Service connections to the HDPE pipe shall be made with materials submitted and approved in accordance with Paragraph 2. Materials. Services shall be reconnected so as to minimize disruption of service.

B. After the new HDPE pipe has been installed and tested, the Contractor shall be responsible for reconnecting existing sewer services in the manner described in the bid form. All service lines shall be the size indicated in the plans and specifications.

4.5 TESTING AND ACCEPTANCE

A. After the new HDPE pipe is installed and all services are reconnected, the line shall be inspected by CCTV. PACP Post-CCTV video shall be submitted to the Engineer or Owner for approval and acceptance of line.

END OF SECTION