FINAL ENVIRONMENTAL IMPACT REPORT - APPENDICES

Newell Creek Pipeline Improvement Project

Prepared for

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

MARCH 2022

CITY OF SANTA CRUZ Water Department

Our Water, Our Future



Prepared by
DUDEK
725 Front Street, Suite 400
Santa Cruz, CA 95060

SCH NO. 2021010166
Contact: Danny DeBrito

Appendix A

Notice of Preparation and NOP Scoping Comments

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CITY OF SANTA CRUZ Water Department

Our Water, Our Future

212 Locust Street, Suite C, Santa Cruz, CA 95060 ◆ (831) 420-5200

January 11, 2021

Notice of Preparation of an Environmental Impact Report and Public Scoping Meeting Notice

RE: Newell Creek Pipeline Improvement Project

To Interested Agencies and Persons:

The City of Santa Cruz (City) as the Lead Agency for the Newell Creek Pipeline (NCP) Improvement Project (Proposed Project) has issued this Notice of Preparation (NOP) pursuant to the California Environmental Quality Act (CEQA) to notify responsible and trustee agencies and other interested parties that an Environmental Impact Report (EIR) will be prepared to evaluate potential environmental impacts of the Proposed Project. The City is soliciting public input regarding the scope and content of environmental information to be included in the EIR.

The NOP provides information about the public review and comment period, project location, project description, and the probable environmental effects of the Proposed Project, and is posted on the City's website at cityofsantacruz.com/waterenvdocs.

Public Review and Comment

The City is interested in receiving input from agencies and the public with regard to the proposed replacement and improvement activities. Your agency may need to use the EIR prepared by our agency when considering your permit or other approval for the Proposed Project, if any is required. Please respond with written comments regarding the proposed scope and the intended content of the EIR as it relates to your agency's area of statutory responsibility or your areas of concern or expertise. We are requesting that all comments be provided in writing to enable us to address the comments as intended in the EIR. Written comments are also requested from organizations and other interested parties regarding the scope and evaluation of potential environmental issues associated with the Proposed Project.

Written responses are due within 30 days of the receipt of this notice, as provided by state law. As such, a 30-day public review and scoping period is established from **January 15, 2020 to February 15, 2020**. Comments may be submitted by mail, email, or by attending the Public Scoping Meeting (see details below) and submitting a written comment. All comments should indicate a contact person for the agency or organization.

All written responses are requested to be received by 5:00 p.m. on Monday, February 15, 2021, and should be sent to the following address:

Doug Valby, Associate Civil Engineer
City of Santa Cruz Water Department
212 Locust Street, Suite C
Santa Cruz, CA 95060
Email: dvalby@cityofsantacruz.com

One public scoping meeting regarding the Proposed Project and EIR will be held. You or members of your agency, organization, or the public are invited to attend to provide written comments on the scope and content of environmental information to be included in the EIR. This meeting will include a brief overview of the proposed project and EIR process and allow time for questions about the project or process. The meeting will be held as follows:

The City of Santa Cruz Water Department (City) will hold one Scoping Meeting on February 2, 2021 at 5:30 p.m. In light of the COVID-19 pandemic, the meeting will be held via Zoom for remote public participation. The call-in number and link for the presentation are provided below.

Please click the link below to join the webinar:
https://zoom.us/j/99843466481

Or iPhone one-tap :
US: +16699009128,,99843466481# or +13462487799,,99843466481#

Or Telephone, dial (for higher quality, dial a number based on your current location):
US: +1 669 900 9128 or +1 346 248 7799 or +1 253 215 8782 or +1 312 626 6799 or +1 646 558 8656 or +1 301 715 8592 or 888 788 0099 (Toll Free) or 833 548 0276 (Toll Free) or 833 548 0282 (Toll Free) or 877 853 5247 (Toll Free)

Webinar ID: 998 4346 6481

International numbers available:
https://zoom.us/u/acZDhEYA13

Project Location and Existing Facilities

The existing NCP is located in the Santa Cruz Mountains in the unincorporated area of Santa Cruz County, except for the portion of the NCP that extends onto the City's Graham Hill Water Treatment Plant (GHWTP) property, which is located within the City, but is surrounded by unincorporated lands. Both the existing NCP and the Proposed Project extend approximately 9 miles between Newell Creek Dam, a City facility that impounds Loch Lomond Reservoir, to the north and GHWTP to the south (see Figure 1).

As shown on Figure 2, the northern segment of the existing pipeline extends from just south of the existing Newell Creek Dam to the Felton Booster Pump Station (FBPS) that is located at the intersection of Graham Hill Road and East Zayante Road. The Proposed Project would generally follow the existing

pipeline alignment in the northern segment with some minor realignments. Both the existing NCP and Proposed Project pipeline cross Newell Creek in two locations in the northern segment. The San Lorenzo River also is a major natural feature in the project area, and is located west of the existing pipeline and Proposed Project in some sections in the northern segment.

The southern segment of the existing NCP extends from the FBPS to the GHWTP. The existing pipeline extends from the FBPS under Zayante Creek and extends through an active lumber yard and Henry Cowell Redwoods State Park and then along Graham Hill Road for approximately one mile to the GHWTP. The Proposed Project also would extend under Zayante Creek and follow a short section along the existing NCP alignment, but would then be rerouted to Graham Hill Road, as shown on Figure 2.

Project Background

The NCP is a critical component of the City's raw water supply infrastructure. It conveys untreated water to and from the Loch Lomond Reservoir (see Figure 1), which is the City's only raw surface water storage facility. The NCP conveys untreated water to Loch Lomond Reservoir from the Felton Diversion on the San Lorenzo River and from Loch Lomond Reservoir to the GHWTP. The pipeline is critical to supplying the water system during dry seasons, extended dry periods, and storm events, when other water sources are diminished or otherwise impaired. The NCP conveys water to the water system via the FBPS to the GHWTP for treatment and distribution into the area served by the City. The FBPS is located approximately midway along the NCP alignment at the intersection of Graham Hill Road and East Zayante Road. When the San Lorenzo River has high flows and storage is available in the Loch Lomond Reservoir, the NCP is also used to pump water from the Felton Diversion on the San Lorenzo River up to the Reservoir (via the FBPS) to store for later use. Although the NCP is not used continuously, it is a critical component to the City's water supply when needed during both wet and dry seasons. It is also a backup source should one of the City's other raw water supplies become inoperable.

The purpose of the Proposed Project is to address the identified deficiencies in existing pipeline conditions, as well as provide improved access for maintenance and repair. The NCP was constructed in approximately 1960, is reaching the end of its useful life, and is experiencing increased frequency of breaks due to corrosion and land movement along portions of its alignment due to geological conditions. Due to steep terrain and landslides present in some locations, the existing NCP has been damaged and/or is located in areas that make access and repairs difficult, such as a portion of the existing NCP along Pipeline Road in Henry Cowell Redwoods State Park and another section along a steep hillside in the Brackney area, east of Highway 9 between Felton and Ben Lomond.

Project Description

The Proposed Project consists of replacement of 8.75 miles of the existing NCP with a new 24-inch polyvinyl chloride (PVC), ductile iron or high-density polyethylene (HDPE) pipeline. The pipeline generally would be installed within existing road pavement, road right-of-way (ROW), and/or existing City's easements. The proposed northern NCP segment from the Newell Creek Access Road Bridge to the FBPS generally follows the existing NCP alignment with a few short re-alignments to avoid crossing private property. Wherever possible, the new pipeline would be installed parallel to the existing pipeline. The proposed southern NCP segment from the FBPS to the GHWTP generally includes a new pipeline section along Graham Hill Road. Figures 3 and 4 show the proposed NCP alignment sections

within the northern and southern segments, respectively. Once the new pipeline is installed and the interconnections are made, the majority of the existing NCP is expected to be abandoned in place.

Other components of the Proposed Project include installation of air release valves that extend approximately 24 inches above ground. The FBPS has been improved over the past decade, and no new pump stations are required. The Proposed Project may include widening and/or paving of existing roadway shoulders within existing road ROW.

Construction

The Proposed Project is scheduled to be constructed in phases over multiple years from approximately 2022 to 2028. Three pipeline sections have been identified as having the highest priority for replacement and would proceed first: the Brackney North section in the northern segment as shown on Figure 3 and the two Graham Hill Road sections in the southern segment that would replace the existing pipe through Henry Cowell State Park as shown on Figure 4. For sections of the pipeline that are installed using standard trenching techniques, it is expected that approximately 60 to 100 linear feet of new pipeline would be installed per day on average.

The majority of the Proposed Project would be installed within existing roadways and using conventional (open cut) trenching methods. Special construction techniques may be utilized in the Brackney area, which has experienced multiple landslides that have damaged the pipeline, and the risk of additional damage by future landslides is of great concern. The methods that would be utilized for this pipeline segment would consist of a combination of constructing the pipeline within the bedrock using micro-tunneling or deep trenches, where feasible. It is anticipated that construction at creek crossings would involve extending the pipeline along existing roadways and bridges, or utilizing trenchless methods to tunnel underneath the creeks. No construction is anticipated within flowing channels. The City has adopted standard construction practices that would be implemented by the City or its contractors during construction activities to provide erosion and air quality controls and water quality and habitat protection. Traffic controls would be in place for construction activities in roadways.

Probable Environmental Effects of the Proposed Project

After completing a preliminary review of the Proposed Project, as described in Section 15060(d) of the CEQA Guidelines, the City has determined that an EIR should be prepared to assess the potentially significant environmental impacts of the Proposed Project. Because the preparation of an EIR is clearly required for the Proposed Project, an Initial Study will not be prepared.

The EIR will address environmental impacts of the Proposed Project's construction and operation activities, and will propose mitigation measures to address significant impacts that are identified. The following describes the anticipated environmental issues that will be addressed in the EIR.

- Air Quality and Greenhouse Gas Emissions. Effects on air quality and greenhouse gas emissions would primarily be associated with construction activities and would be temporary and short term. However, both construction and operational emissions of criteria pollutants and greenhouse gasses will be estimated using the California Emissions Estimator Model emissions model and compared to the Monterey Bay Air Resources District emissions-based thresholds to assess potential impacts.

- Biological Resources. Potential impacts on biological resources could result from construction near existing waterways, such as Newell and Zayante Creeks, and sensitive habitat areas, such as the Zayante Sandhills. The Zayante Sandhills are a unique community of plants and animals found in the project area. Potential direct and indirect impacts to sensitive vegetation communities, special-status plant and wildlife species, and jurisdictional aquatic resources associated with both construction and operation of the Proposed Project will be assessed based on a biological survey of the study area and preparation of a technical biological resources report to support the EIR analysis.
- Cultural and Tribal Cultural Resources. Potential impacts to cultural and tribal cultural resources that could occur during ground-disturbing construction activities will be evaluated. This includes both archaeological and historical resources. A cultural resources inventory and evaluation report will be prepared to support the EIR analysis.
- Energy. A temporary increase in the consumption of energy would be required during construction and limited change in the use of power would be required for operation of the pipeline. The impact analysis will assess if the Proposed Project would result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency.
- Geology and Soils. Construction of the Proposed Project could result in site-specific impacts on or from local geology and soils conditions. Potential impacts related to geologic, seismic, and soils constraints will be assessed. Potential impacts to paleontological resources will also be evaluated.
- Hazards and Hazardous Materials. Potential impacts related to hazards and hazardous materials will be evaluated including the potential hazardous materials associated with transport, use, and disposal of hazardous materials during construction and potential hazardous emissions or hazardous materials used during construction and operations.
- Hydrology and Water Quality. Potential impacts related to hydrology and water quality will be assessed including temporary and permanent impacts to hydrology and water quality as a result of near-stream construction.
- Noise and Vibration. Potential construction-period noise and vibration impacts to sensitive receivers (residences) in the vicinity of the Proposed Project will be assessed with modeling based on noise measurements taken at the site and review of construction phases and equipment usage. Operational noise would not be expected to change with the Proposed Project and therefore will not be analyzed in detail in the EIR.
- Transportation. Construction-related vehicle trips will be estimated and temporary construction-related traffic will be evaluated to identify any hazardous conditions on roadways or inadequacies in emergency access that may result during construction of the Proposed Project. Operation-period vehicle trips are anticipated to be similar to existing conditions, and will be described in the EIR.
- Wildfire. The Proposed Project is located in a state responsibility area, traversing moderate and high fire hazard severity zones. Therefore, this section will focus on the potential for construction activities to impair an emergency response or evacuation plan, exacerbate

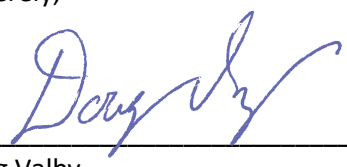
wildfire risks, and expose people to risks due to post-fire effects, consistent with standards in the CEQA Guidelines Appendix G. The focus will be on elements of construction that could exacerbate fire hazard risks, however, once construction is completed, the underground pipeline would not create conditions that would affect wildland fire risks.

- Impacts Not Found Significant. The EIR will explain why other effects were determined to not be potentially significant and were not discussed in detail in the EIR. For example, the pipeline would not be visible from public viewpoints, would not damage scenic resources, or produce light and glare; therefore, no significant aesthetic impacts are anticipated.
- Other Sections. The EIR will include additional topics as required by the CEQA Guidelines including significant irreversible environmental changes, growth inducement, cumulative impacts, and alternatives. The EIR will describe and evaluate a reasonable range of alternatives to the Proposed Project that would feasibly attain most of the Proposed Project's basic objectives while avoiding or substantially lessening any significant effects of the Proposed Project. These alternatives may include alternative pipeline routes, including the Quail Hollow Road and Mount Hermon Road corridors, alternative construction techniques, and/or rehabilitation and/or replacement in place of the existing pipeline. For each alternative, the EIR will assess the degree to which it might reduce one or more identified significant project impacts, whether it could result in other new or increased impacts, its feasibility, and the degree to which it is consistent with the project objectives. The "No Project" alternative will also be evaluated as required by CEQA.

Further Information

For environmental review information or questions about the Proposed Project, please contact Doug Valby at dvalby@cityofsantacruz.com.

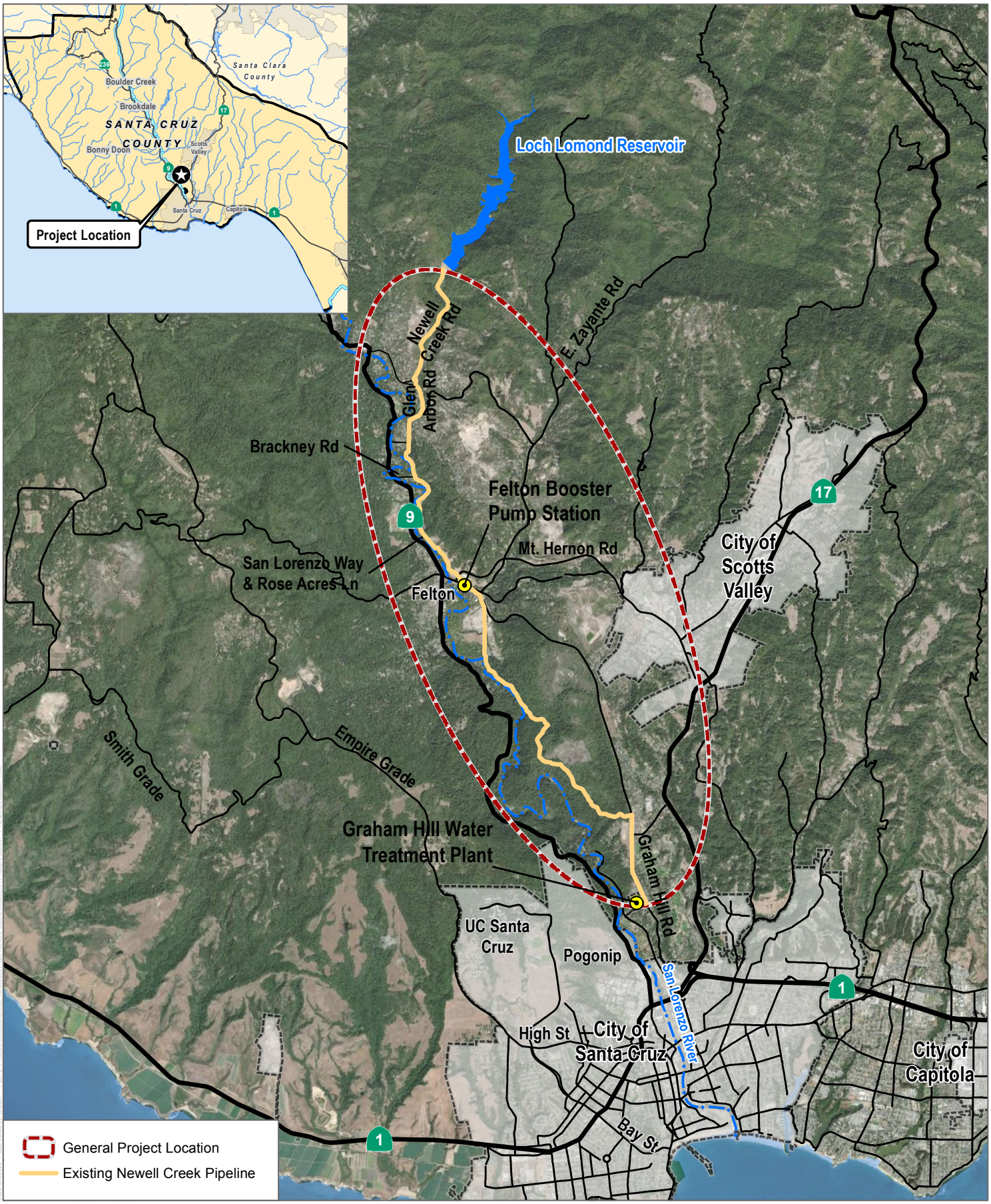
Sincerely,



Doug Valby
Associate Civil Engineer

Attachments

Figure 1: Regional Location
Figure 2: Proposed Newell Creek Pipeline Improvement Project Overview
Figure 3: Proposed Newell Creek Pipeline Improvement Project Northern Segment
Figure 4: Proposed Newell Creek Pipeline Improvement Project Southern Segment



SOURCE: ESRI 2020, City of Santa Cruz 2020

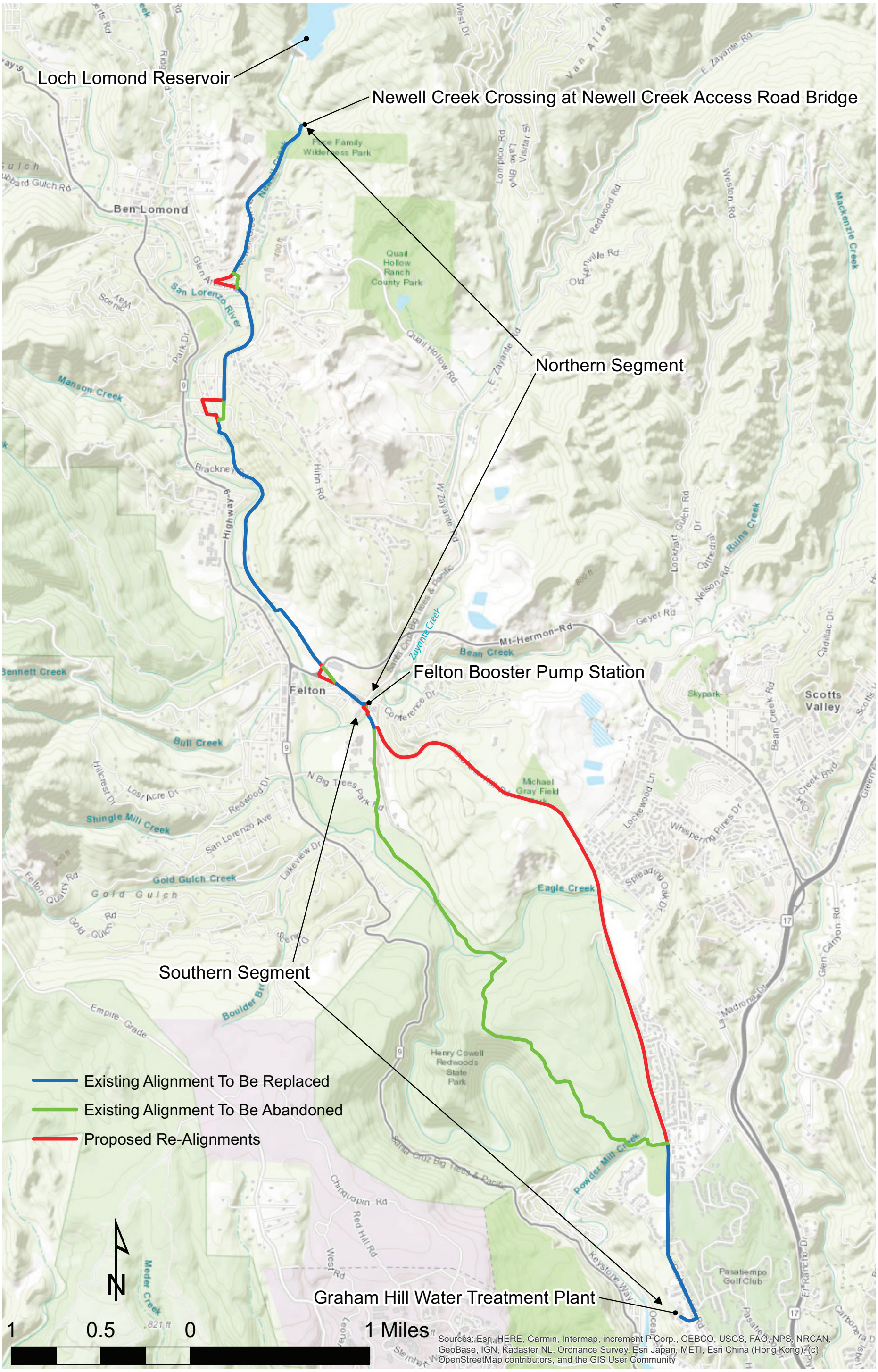
DUDEK

0 3,750 7,500 Feet

FIGURE 1

Project Location

Newell Creek Pipeline Improvement Project



SOURCE: City of Santa Cruz Water Department 2020

FIGURE 2

Proposed Newell Creek Pipeline Improvement Project Overview

Newell Creek Pipeline Improvement Project

DUDEK

Loch Lomond Reservoir

Newell Creek Crossing at Newell Creek Access Road Bridge

Newell Creek Road Section

Newell Creek Crossing at Glen Arbor Road Bridge

Glen Arbor Road Section

Brackney North Section
(Brackney Landslide Area Pipeline Risk Reduction Project)

Brackney South Section

San Lorenzo Way Section

Felton Booster Section

Felton Booster Pump Station

Existing Alignment To Be Replaced

Existing Alignment To Be Abandoned

Proposed Re-Alignments

0.5 0.25 0 0.5 Miles

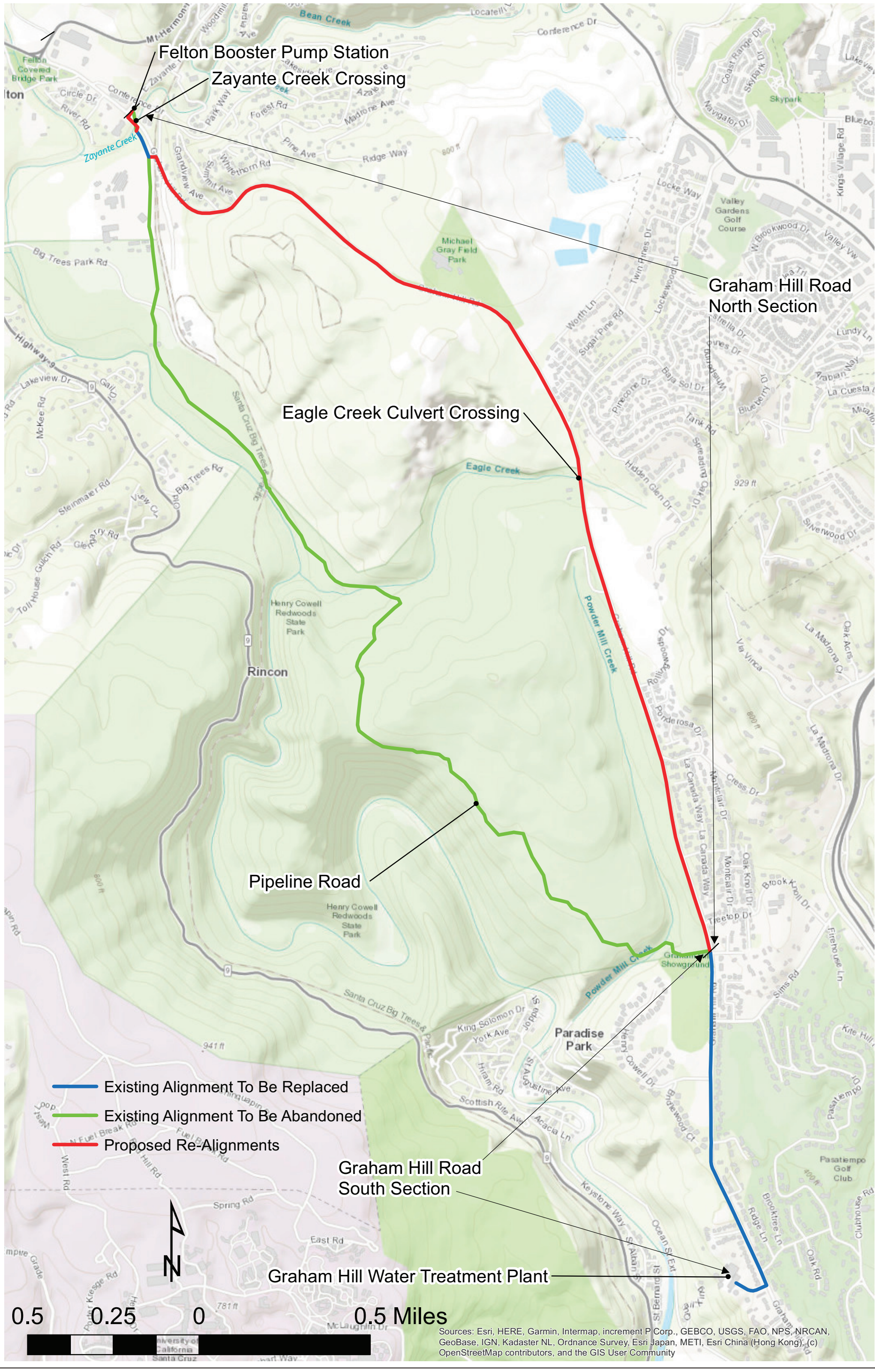
SOURCE: City of Santa Cruz Water Department 2020

FIGURE 3

Proposed Newell Creek Pipeline Improvement Project Northern Segment

Newell Creek Pipeline Improvement Project

DUDEK



SOURCE: City of Santa Cruz Water Department 2020

FIGURE 4

Proposed Newell Creek Pipeline Improvement Project Southern Segment

DUDEK

STATE OF CALIFORNIA Gavin Newsom, Governor

NATIVE AMERICAN HERITAGE COMMISSION

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NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

January 19, 2021

Doug Valby
City of Santa Cruz Water Development Dept
212 Locust Street, Suite C
Santa Cruz, CA 95060

RECEIVED
JAN 28 2021
CITY OF SANTA CRUZ
WATER DEPT.

Re: 2021010166, Newell Creek Pipeline Replacement Project, Santa Cruz County

Dear Mr. Valby:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

- **a.** A brief description of the project.
- **b.** The lead agency contact information.
- **c.** Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
- **d.** A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

- **a.** For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

- **a.** Alternatives to the project.
- **b.** Recommended mitigation measures.
- **c.** Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

- **a.** Type of environmental review necessary.
- **b.** Significance of the tribal cultural resources.
- **c.** Significance of the project's impacts on tribal cultural resources.
- **d.** If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

- **a.** Whether the proposed project has a significant impact on an identified tribal cultural resource.
- **b.** Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or

b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

a. Avoidance and preservation of the resources in place, including, but not limited to:

i. Planning and construction to avoid the resources and protect the cultural and natural context.

ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

i. Protecting the cultural character and integrity of the resource.

ii. Protecting the traditional use of the resource.

iii. Protecting the confidentiality of the resource.

c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).

e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).

f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.

b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
   a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
   b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
   a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
   b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
   c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Nancy.Gonzalez-Lopez@nahc.ca.gov.

Sincerely,



Nancy Gonzalez-Lopez
Cultural Resources Analyst

cc: State Clearinghouse

Appendix B

Biological Resources Assessment

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BIOLOGICAL RESOURCES ASSESSMENT
for the
NEWELL CREEK PIPELINE IMPROVEMENT PROJECT

Prepared for:

City of Santa Cruz Water Department
212 Locust Street, Suite C
Santa Cruz, California 95060
Contact: Danny DeBrito

Prepared by:

DUDEK
725 Front Street, Suite 400
Santa Cruz, California 95060
Contact: Ryan Henry

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1 Introduction

The City of Santa Cruz's (City) Newell Creek Pipeline is a critical component of the City's raw water supply infrastructure. The Newell Creek Pipeline (NCP) conveys untreated water to and from the Loch Lomond Reservoir, which is the City's only raw water storage facility. The NCP conveys water to the water system, which is managed by the Santa Cruz Water Department (City), via the Felton Booster Pump Station (FBPS) to the Graham Hill Water Treatment Plant (GHWTP) for treatment and distribution into the City water service area. When the San Lorenzo River has high flows and storage is available in the Loch Lomond Reservoir, the NCP is also used to pump water from the Felton Diversion on the San Lorenzo River up to the Reservoir (via the FBPS) to store for later use.

The Newell Creek Pipeline Improvement Project (Proposed Project) proposes to replace approximately 8.75 miles of the existing NCP with a new 24-inch polyvinyl chloride (PVC), ductile iron or high-density polyethylene (HDPE) pipeline. The pipeline generally would be installed within existing road pavement, road right-of-way (ROW), and/or existing City's easements. Once the new pipeline is installed and the interconnections are made, the existing NCP would be removed or abandoned in place. Other components of the Proposed Project include installation and/or replacement of minor appurtenances, such as air release valves that extend approximately 24 inches above ground and isolation valves.

The purpose of this report is to (1) describe the conditions of biological resources within the Proposed Project area in terms of vegetation communities, plants, wildlife, wildlife habitat, and wetlands; (2) identify potential direct and indirect impacts to biological resources that could result from the Proposed Project; (3) discuss those impacts in light of federal, state, and local laws and policies protecting biological resources; and (4) specify measures to mitigate any significant or potentially significant impacts.

1.1 Project Location

The existing NCP is located in the Santa Cruz Mountains, primarily in the unincorporated San Lorenzo Valley area of Santa Cruz County, except for the portion of the NCP that extends onto the City's Graham Hill Water Treatment Plant (GHWTP) property, which is located within the City of Santa Cruz, but is surrounded by unincorporated lands. Both the existing NCP and the Proposed Project extend approximately 9 miles between GHWTP on the south and Newell Creek Dam, a City facility that impounds Loch Lomond Reservoir, on the north (see Figure 1).

The existing NCP and Proposed Project alignment are located within a primarily semi-rural area. The areas surrounding the existing NCP and Proposed Project are characterized by forested terrain with rural and semi-rural, low-density residential neighborhoods and limited commercial development, as well as areas of California State Parks land. Several streams are present in the general vicinity of the NCP, including San Lorenzo River, Zayante Creek, and Newell Creek.

The Proposed Project consists of two segments: northern and southern (Figure 2, Proposed Project). The northern segment of the existing pipeline extends from just south of the existing Newell Creek Dam to the Felton Booster Pump Station (FBPS), located at the intersection of Graham Hill Road and East Zayante Road. The northern segment is located east of Highway 9 and north of Mount Hermon Road, generally between the unincorporated communities of Felton and Ben Lomond and west of Lompico in the San Lorenzo Valley. The existing pipeline extends south from the toe of Newell Creek Dam and generally follows existing roads through residential neighborhoods, but also extends through undeveloped private property along an abandoned railroad bed in the Brackney Road and Rose Acres Lane neighborhoods.

The southern segment of the existing NCP extends from the FBPS to the GHWTP. The existing pipeline extends from the FBPS under Zayante Creek follows a dirt maintenance road in a 20-foot easement to the San Lorenzo Lumber Yard where it continues southerly within a 20-foot easement to the border of Henry Cowell Redwoods State Park. The existing pipeline traverses the State Park within an easement along Pipeline Road until it intersects Graham Hill Road at Nepenthe Drive..

Access to the existing pipeline for maintenance and to the Proposed Project segments for construction and future maintenance is provided by both regional and local roads. Access to the existing pipeline and Proposed Project northern segment is provided by Graham Hill Road, Mount Hermon Road, and State Route 9 (locally referred to as Highway 9), as well as several County roads, including Glen Arbor Road, Newell Creek Road, Brackney Road, San Lorenzo Way, and Rose Acres Lane. Access to the existing NCP and the Proposed Project southern segment is provided from Graham Hill Road, Mount Hermon Road, and Highway 9. Pipeline Road, a partially paved trail through Henry Cowell Redwoods State Park, provides access to the existing NCP section in this location, In addition to the public roadways providing access to the existing and Proposed Project segments. City easements on private land serve portions of the existing alignments and would continue to serve the Proposed Project segments, with a few minor modifications.

For the purposes of this report, a biological study area (BSA) was established to analyze potential impacts resulting from implementation of the Proposed Project. The BSA included the pipeline sections within the Northern Segment (Newell Creek Dam, Newell Creek Road, Glen Arbor Road, Brackney North, Brackney South, San Lorenzo Way, and Felton Pump Station) and Southern Segment (Santa Cruz Lumber Yard, Henry Cowell Redwoods State Park, Pipeline Road, Graham Hill Road North, and Graham Hill Road South), including identified construction staging areas, plus a 300-foot buffer on both sides of the centerline. The BSA includes a total of 982.82 acres.

1.2 Project Description

1.2.1 Project Background

There are a number of known concerns regarding the condition and operation of the existing NCP. Generally, the pipeline, constructed nearly 60 years ago, is reaching the end of its useful life and is experiencing increased frequency of breaks as a result of corrosion and land movement along portions of its alignment due to geological conditions. There is no functioning cathodic protection system[1] on the pipeline and corrosion has been observed, which presents risks of leaks and failure.

Due to steep terrain and landslides present in some locations, the existing NCP has been damaged and/or is located in areas that make access and repairs difficult. A portion of the existing NCP along Pipeline Road in Henry Cowell Redwoods State Park has the highest recent break history, and several areas of Pipeline Road have washed out, resulting in exposure of the pipeline. Another portion of the NCP was constructed in an old railroad bed along a steep hillside in the Brackney area, east of Highway 9 between Felton and Ben Lomond, which includes several landslide hazard areas that could cause stress or breakage of the pipeline as further explained below. Furthermore, some appurtenances, such as isolation valves are inoperable, or are unknown in location, and some portions of the

[1] Cathodic protection is a technique used to control the corrosion of a metal surface by making it the cathode of an electrochemical cell. A simple method of protection connects the metal to be protected to a more easily corroded "sacrificial metal" to act as the anode. The sacrificial metal then corrodes instead of the protected metal. For structures such as long pipelines, where passive galvanic cathodic protection is not adequate, an external DC electrical power source is used to provide sufficient current.

existing pipeline alignment have appurtenant structures (such as fences, retaining walls and sheds) constructed on top of the pipeline (HDR 2018).

The pipeline section that runs through the Brackney area has a history of landslides and geotechnical failures during heavy winter rains that threaten the integrity of the pipeline.. This section has been historically subject to repeated landslides during heavy winter rains. In addition, the NCP is located above and adjacent to the San Lorenzo River, which during high flows in winter storms has the potential to undermine the hillside and increase the risk of failure. Due to the evidence of unstable terrain due to the poor bearing capacity of the saturated soils, the continued buildup of landslide debris overburden over the pipeline, and the location of the pipeline next to the San Lorenzo River, the NCP is at a high risk of failure in the Brackney North area. In particular, the NCP is vulnerable to a leak, which may be exacerbated by other factors in the vicinity of the Brackney landslide including undermining by San Lorenzo River flooding and proximity to the Butano fault zone (Kennedy Jenks 2017). Additionally, the Brackney pipeline section is one of the few sections that is not accessible by paved road, making repairs and maintenance challenging (HDR 2019c).

1.2.2 Proposed Project Description

The Proposed Project consists of replacement of 8.75 miles of the existing NCP with a new 24-inch polyvinyl chloride or ductile iron pipeline. The pipeline generally would be installed within existing road pavement, road right-of-way (ROW), which includes road pavement and unpaved shoulders adjacent to the paved road, and/or existing City easements. Additional easements would be acquired in some locations. In order to focus the environmental review on specific locations along the 8.75-mile pipeline, the alignment was separated into a northern segment and a southern segment; these segments were further delineated into specific sections as described below

The proposed northern NCP segment from the Newell Creek Access Road Bridge to the FBPS generally follows the existing NCP alignment with a few short re-alignments to avoid crossing private property. The proposed southern NCP segment from the FBPS to the GHWTP generally includes a new pipeline section along Graham Hill Road. Other components of the Proposed Project include installation and/or replacement of minor appurtenances, such as air release valves and isolation valves. Once the new pipeline is installed and the interconnections are made, the existing NCP would be removed or abandoned in place. Key features of the Proposed Project are summarized in Table 1

Three pipeline sections have been prioritized for replacement in the near term: two sections along Graham Hill Road, comprising the entire southern segment that would replace the existing pipe through Henry Cowell Redwoods State Park and the Brackney North section in the northern segment. The engineering design for these sections is underway. For the remainder of the pipeline alignment, a conservative project scenario is assumed, which includes installation of the new pipeline within specified construction disturbance corridors.

Standard construction practices would be implemented by the City or its contractors during construction of the Proposed Project to avoid or minimize erosion and water quality degradation, protect sensitive species and habitat, reduce potential impacts to cultural resources, and reduce air quality and noise impacts. Upon completion of construction, construction sites would be revegetated and/or restored, and disturbed roadways where trenching occurred to install the pipeline would be repaved in accordance with County requirements.

Table 1. Key Proposed Project Features

Project Feature	Northern Segment Newell Creek Road to FBPS	Southern Segment FBPS to GHWTP
Alignment Length (feet)	21,838	23,745
Number of Creek or River Crossings	3	1
Maximum Elevation (feet above mean sea level)	392	727

Source: HDR 2019a.

Northern Segment

The northern segment of the Proposed Project is planned within the same alignment as the existing pipeline with some minor realignments to avoid private properties as shown on Figure 2. The new pipeline would be installed within existing roadways, road ROWs, and/or City easements. The northern segment has a maximum surface elevation of approximately 392 feet above mean sea level, can gravity flow to the Felton Booster pump station, and has two creek crossings over Newell Creek and over one unnamed tributary to San Lorenzo River. Three short portions of pipe sections are currently under private property and would be rerouted as described below.

There are six distinct sections that comprise the northern segment as discussed below.

- **Newell Creek Road Section**. The northernmost pipeline section, Newell Creek Road, extends 5,035 feet within a road ROW. The section begins on the north side of the bridge crossing of Newell Creek (Newell Creek Access Road Bridge), crosses Newell Creek and follows Newell Creek Road to Glen Arbor Road. The existing pipeline is attached to the lower side of the upstream side of the bridge and is planned to be removed and replaced with the new pipe in either the same location or on the downstream side of the bridge. The Proposed Project would place the new pipeline entirely within the 60- to 100-foot wide road ROW, and generally.

- **Glen Arbor Road Section.** The Glen Arbor Road section extends 5,120 feet within a road ROW. The existing pipeline crosses through private property from Newell Creek Road to Glen Arbor Road, where it again crosses Newell Creek and continues along Glen Arbor Road and onto Caledonium Avenue. The existing pipeline also crosses private property at the southern terminus of Caledonium Avenue, where it jogs across to Fremont Avenue before continuing southward to the Brackney Road neighborhood. The Proposed Project would avoid the private property between Newell Creek Road and Glen Arbor Road and be located entirely within the 40- to 100-foot wide public road ROW, and generally within the existing road pavement of both roads..

- **Brackney North Section.** The Brackney North pipeline section extends approximately 2,610 feet between Glen Arbor Road, Schaaf Road and Brackney Road as shown on Figure 3-8. The majority of the pipeline would be a single fused pipeline of fusible polyvinyl chloride (FPVC) or HDPE, which would be installed using a horizontal directional drilling (HDD) trenchless method. Generally, the HDD method consists of a guided and steered trenchless construction technique to install the pipe into the subsurface as further described in Section 3.6.2.2. The pipe would be installed at depths of approximately 80 to 100 feet. Installation of the Brackney North pipe section also will include open cut trench construction for approximately 720 linear feet within a 4-foot wide trench. Open trench construction would occur at the north tie-in along Schaaf to Glen Arbor to Caledonium, and also at the south tie-in.

- **Brackney South Section.** The Brackney South section extends approximately 2,860 feet within a 10-foot wide City easement, partially unpaved and partially within road pavement. The section extends from the Brackney North section to San Lorenzo Way. The San Lorenzo River is located adjacent to portions of this section on the west. The Brackney South section ends at the property boundary near the northern intersection of San Lorenzo Way and Rose Acres Lane. The potential for deeper-seated landslides exists in the Brackney South section through most or all of the soil mass above the bedrock. Construction of a cantilevered retaining wall is being considered for a portion of the Brackney South section, which would help prevent potential slides from moving downslope. Installation may also occur with directional drilling or conventional open trench methods.

- **San Lorenzo Road Section.** The San Lorenzo Way section extends south from San Lorenzo Way/Rose Acres Lane approximately 4,242 feet within a 10-foot wide City easement through private property. The San Lorenzo River is located adjacent to portions of this section on the west, and the pipeline crosses an unnamed creek. This pipe section ends at Mount Hermon Road.

- **Felton Pump Station Section.** The Felton Pump Station section extends 1,970 feet from Mount Hermon Road at Graham Hill Road to the FBPS. A portion of this section has been re-aligned to avoid passing through the parking lot of Felton Fair Shopping Center where the current pipeline is located. The proposed pipeline would be installed within Mount Hermon Road and Graham Hill Road, ending at the FBPS.

Southern Segment

The southern segment of the proposed NCP extends from the FBPS to the GHWTP and generally consists of installation of a new 24-inch pipeline constructed within easements and Graham Road from the FBPS to Pipeline Road, and replacement of the southernmost section of existing pipeline located in Graham Hill Road from Pipeline Road to GHWTP as shown on Figure 2 and summarized on Table 1. The paved roadway width of Graham Hill Road varies between 28 and 40 feet in a 40- to 90-foot-wide ROW. This alignment would replace the existing NCP Santa Cruz Lumber Yard section, as well as the existing Henry Cowell Redwoods State Park and Pipeline Road sections through Henry Cowell Redwoods State Park.

The southern segment has a maximum elevation of approximately 727 feet above mean sea level, one creek crossing at Zayante Creek and two culverted creek crossings (Eagle Creek and Powder Hill Creek). The southern segment is comprised of two sections, Graham Hill Road North and South. The paved roadway width of Graham Hill Road varies between 28 and 40 feet in a 40- to 100-foot wide County ROW. This alignment would realign the portion of the existing NCP which passes through the San Lorenzo Lumber Yard, as well as the existing Pipeline Road sections through Henry Cowell Redwoods State Park into Graham Hill Road.

- **Graham Hill Road North Section.** The new pipeline extends 17,880 feet (approximately 3.4 miles) south from the FBPS to Graham Hill Road intersection with Pipeline Road. The first portion of the new pipeline would extend across Graham Road and over Zayante Creek adjacent to the City's Felton Diversion Pipeline. The proposed pipeline would then be installed in the City's existing 20-foot-wide easement, which also contains the existing pipeline is located within an unpaved, approximately 12-foot-wide path within the easement. The pipeline would cross the Santa Cruz Big Trees and Pacific Railway existing rail tracks via a trenchless method to Graham Hill Road, where the new pipeline would be installed within the Graham Hill Road pavement, primarily on the eastern side of the road.

- **Graham Hill Road South Section.** This section extends 5.865 feet along Graham Hill Road from its intersection at Pipeline Road south to the GHWTP. The southern approximately 3,600-linear feet of this pipeline would entail removal of the existing NCP and installation of the new pipeline in the current NCP location, which is generally near the center or eastern side of the existing paved road. In.

Other Components

Other components of the Proposed Project including the appurtenances and improvements, post-construction revegetation/restoration, decommissioning of existing pipeline, which are described below.

- **Appurtenances and Improvements.** Other components of the Proposed Project include installation of air release valves, isolation valves, blowoffs and other appurtenances. Air release valves would be installed that extend approximately 24 inches above ground. Existing air valves will be replaced, and new air valves will be required in new pipeline sections in locations to be determined during design. The FBPS has been improved over the past decade, and no new pump stations are required. No other improvements or appurtenances have been identified for the Proposed Project.

- **Post-Construction Revegetation/Restoration.** Upon completion of construction, construction sites would be revegetated and/or restored, and disturbed paved roadways would be repaved in accordance with County requirements.

- **Decommissioning of Existing Pipeline.** Once the new NCP pipeline sections are completed and operational, the existing pipeline sections would be decommissioned. This would generally involve capping off the existing pipeline and injecting the pipeline with grout, except in the Brackney North section, which would be abandoned by cutting and capping the existing pipeline. With the decommissioning of existing NCP sections, existing fire hydrants along Pipeline road in Henry Cowell Redwoods State Park also would be abandoned. All above-grade appurtenances along the abandoned pipeline would be completely removed.

Operations and Maintenance

After installation of the Proposed Project, operations would include continued implementation of pump start-up and valve operations at the FBPS, when needed to pump water to/from Loch Lomond Reservoir. Once installed, maintenance of the pipeline would include intermittent, periodic inspections and maintenance of air valves with access provided to the pipeline sections by existing roads and easements. The Brackney North pipeline section would have isolation and air valves on either end of the new pipeline and would not need to be accessed in the future unless removed for replacement (HDR 2020)..

1.2.3 Standard Construction Practices

The City has adopted standard construction practices that would be implemented by the City or its contractors during construction activities associated with the Proposed Project, where relevant.

Erosion Control and Air Quality Control

1. Implement erosion control best management practices for all construction activities occurring in or adjacent to jurisdictional aquatic resources (resources subject to permitting under the Clean Water Act, Clean Water Act , Porter-Cologne Water Quality Act and/or California Fish and Game Code). These measures may include, but are

not limited to, (1) installation of silt fences, fiber or straw rolls, and/or bales along limits of work/construction areas and from the edge of the water course; (2) covering of stockpiled spoils; (3) revegetation and physical stabilization of disturbed graded and staging areas; and (4) sediment control including fencing, dams, barriers, berms, traps, and associated basins.

2. Provide stockpile containment and exposed soil stabilization structures (e.g., Visqueen plastic sheeting, fiber or straw rolls, gravel bags, and/or hydroseed).

3. Provide runoff control devices (e.g., fiber or straw rolls, gravel bag barriers/chevrons) used during construction phases conducted during the rainy season. Following all rain events, runoff control devices shall be inspected for their performance and repaired immediately if they are found to be deficient.

4. Implement wind erosion (dust) controls, including the following:
   - Use a water truck;
   - Water active construction areas as necessary to control fugitive dust;
   - Hydro seed and/or apply non-toxic soil binders to exposed cut and fill areas after cut and fill operations;
   - Cover inactive storage piles;
   - Cover all trucks hauling dirt, sand, or loose materials off site; and
   - Install appropriately effective track-out capture methods at the construction site for all exiting trucks.

Water Quality Protection

5. Locate and stabilize spoil disposal sites and other debris areas such as concrete wash sites. Sediment control measures shall be implemented so that sediment is not conveyed to waterways or jurisdictional aquatic resources (resources subject to permitting under the Porter-Cologne Water Quality Act Section 1300 et seq., Clean Water Act Section 404, Clean Water Act Section 401, and/or California Fish and Game Code).

6. Minimize potential for hazardous spills from heavy equipment by not storing equipment or fueling within a minimum of 65 feet of any jurisdictional aquatic resource unless approved by permitting agencies along with implementation of additional spill prevention methods such as secondary containment and inspection.

7. Ensure that appropriate measures are taken to prevent gas, oil, or any other substances that could be hazardous to aquatic life or pollute habitat from contaminating the soil or entering jurisdictional aquatic resources by storing these types of materials within an established containment area. Vehicles and equipment will have spill kits available, be checked daily for leaks, and will be properly maintained to prevent contamination of soil or water from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease. Any gas, oil, or other substance that could be considered hazardous shall be stored in water-tight containers with secondary containment. Emergency spill kits shall be on site at all times.

8. Prevent equipment fluid leaks through daily equipment inspections.

9. Implement proper waste/trash management.

The City's Standard Construction Practices for In-Channel Work and Fish Species Protection (Practices #10-12) are not applicable to the Project because no work would occur within flowing water.

General Habitat Protection

13. Minimize disturbance of riparian vegetation to the maximum extent feasible when working in or adjacent to an active stream channel.

14. Restore all temporarily disturbed sensitive natural communities areas by replanting native vegetation using a vegetation mix appropriate for the site.

The City's Standard Construction Practice for decontamination of tools and equipment prior to entering waterways (Practice #15) is not applicable to the Project because no work would occur within flowing water.

16. A qualified biologist shall conduct a training-educational session for project construction personnel prior to any mobilization-construction activities within the project sites to inform personnel about species that may be present on site. The training shall consist of basic identification of special-status species that may occur on or near the project site, their habitat, their basic habits, how they may be encountered in the work area, and procedures to follow when they are encountered. The training will include a description of the project boundaries; general provisions of the Migratory Bird Treaty Act, California Fish and Game Code, and federal and state Endangered Species Acts; the necessity for adhering to the provision of these regulations; and general measures for the protection of special-status species, including breeding birds and their nests. Any personnel joining the work crew later shall receive the same training before beginning work.

The City's Standard Construction Practices for Dewatering (Practices #17-23) are not applicable to the Project because no work would occur within flowing water.

Inadvertent Discoveries of Archaeological Resources and Human Remain

24. Any unrecorded archaeological resources (sites, features, and/or artifacts) exposed during construction are subject to protection and consideration under CEQA and the California Public Resources Code (PRC) as well as Section 106 of the National Historic Preservation Act (NHPA) as detailed in the Code of Federal Regulations (CFR). The CEQA Guidelines Section 15064.5(f) specifically addresses provisions the City of Santa Cruz will make regarding accidental discovery of historical or unique archaeological resources during construction. The responsibilities of the lead federal agency to avoid, minimize or mitigate adverse effects to a "historic property" (36 CFR Section 800.16) are detailed in 36 CFR Section 800.13[b] and would be applicable for a project with federal involvement by way of funding, permitting, approval authority, or other means.

    In general, the implementation procedures under CEQA and the NHPA in the case of an inadvertent archaeological discovery during construction are similar and are as follows:

    - If archaeological resources are exposed immediately stop any construction work occurring within 100 feet which may further disturb the find. NOTE – This is a general guideline for the initial response, the exclusion zone may be contracted or expanded depending on the nature of discovery and type of construction activity proposed in the vicinity of the find. The duration of the exclusion zone will be determined by the City and the federal lead agency and is contingent on the approved course of action in response to the discovery.
    - Immediately notify the City Project Manager who shall immediately notify the Water Department Deputy Director/Engineering Manager

- A qualified archaeologist meeting the Secretary of the Interior's Professional Qualification Standards will evaluate the state and federal significance of the find for eligibility to the California Register of Historical Resources (CRHR) and the National Register of Historic Places (NRHP) in coordination with City staff.
- The City will notify the lead federal agency within 24 hours of discovery. The notification shall describe the assessment of the NRHP eligibility of the resource, specify the NRHP criteria used to evaluate the property's eligibility, and propose actions to resolve any adverse effects.
- The federal lead agency will contact the State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP), and any interested locally affiliated Native American tribes. The SHPO, ACHP, and Native American tribes will respond within 48 hours of the notification. The federal lead agency shall consider any recommendations regarding National Register eligibility and proposed actions and notify the City of the appropriate actions. The federal lead agency official shall provide the SHPO and the ACHP a report of the actions when they are completed.
- Avoidance and/or minimization of impacts/effects is the preferred course of actions under both state and federal guidelines. If preservation in place is not feasible, additional study will likely be required. In coordination with the lead federal agency, the City will prepare a data recovery/treatment plan for retrieving important archaeological data relevant to the site's significance. The data recovery/treatment plan will be submitted to participating tribes and agencies for review and comment prior to implementation.
- If the inadvertent discovery location cannot be avoided, and continuing work would have an adverse effect on the site, the federal agency, in coordination with the City, SHPO, and Native American tribes as appropriate, will need to draft and finalize a Memorandum of Agreement for the treatment of the historic property before work can proceed.
- Implementation of the data recovery/treatment plan may include archaeological excavations, technical and laboratory analysis, and further consultation and coordination with Native American tribal representatives.
- A full written report will be prepared to include the results of all technical analyses and special studies and will be provided to participating tribes and agencies for review and comment. The report will be filed with the Northwest Information Center and will also provide for the permanent curation of recovered materials.

25. In California, the illegal possession of human remains is a felony, punishable by imprisonment (California Penal Code Section 1170[h]; Public Resources Code 5097.99[a] and [b]). Inadvertent discoveries of human remains exposed during construction on non-federal lands are subject to protection under CEQA and the NHPA. In accordance with Section 7050.5 of the California Health and Safety Code and the NHPA, if potential human remains are found, immediately notify the City, the lead federal agency, and the Santa Cruz County Coroner of the discovery. The Santa Cruz County Coroner will provide a determination within 48 hours of notification. No further excavation or disturbance of the identified material, or any area reasonably suspected to overlie additional remains, can occur until a determination has been made.

    - If human remains are exposed **immediately stop any construction work occurring within 100 feet** which may further disturb the find. NOTE – This is a general guideline for the initial response, the exclusion zone may be contracted or expanded depending on the nature of discovery and type of construction

activity proposed in the vicinity of the find. The duration of the exclusion zone is contingent on the course of action mandated by the City and lead federal agency.

- If the Santa Cruz County Coroner determines that the remains are, or are believed to be, Native American, the coroner will notify the Native American Heritage Commission (NAHC) within 24 hours and all the actions described in these Standard Construction Practices regarding Inadvertent Archaeological Discoveries shall be followed.
- In accordance with California Public Resources Code, Section 5097.98 and Section 106 of the NHPA, the NAHC must immediately notify those persons it believes to be the Most Likely Descendant (MLD) from the deceased Native American.
- Within 48 hours of this notification, the MLD will recommend to the City and lead federal agency her/his preferred treatment of the remains and associated grave goods.
- The ultimate disposition of the remains will be coordinated between the City, the federal agency, the MLD, the landowner, and the NAHC (if necessary).
- The lead federal agency will have additional government-to-government consultation requirements per the requirements of Section 106 [36 CFR § 800.2(c)(2)(ii)] which cannot be delegated to non-federal entities.

Other Practices

26. Notify adjacent property owners of nighttime construction schedules. A Construction Noise Coordinator will be identified. The contact number for the Construction Noise Coordinator will be included on notices distributed to neighbors regarding planned nighttime construction activities. The Construction Noise Coordinator will be responsible for responding to any local complaints about construction noise. When a complaint is received, the Construction Noise Coordinator shall notify the City within 48 hours of the complaint, determine the cause of the noise complaint, and implement as possible reasonable measures to resolve the complaint, as deemed acceptable by the City.

27. For construction in wildlands or in the wildland-urban interface, internal combustion engine equipment shall include spark arrestors, fire suppression equipment (e.g. fire extinguishers and shovels) shall be stored onsite during use of such mechanical equipment, and construction activities shall not be conducted during red flag warnings issued by the California Department of Forestry and Fire Protection (CAL FIRE) unless adequate fire protection measures are implemented in compliance with federal, state, and local fire prevention and protection regulations and guidance. Fire safety measures will be detailed in a Fire Safety Program on a project-by-project basis. Red flag warnings and fire weather watches are issued by CAL FIRE based on weather patterns (low humidity, strong winds, dry fuels, etc.) and listed on their website (https://www.fire.ca.gov/programs/communications/red-flag-warnings-fire-weather-watches/).

2 Regulatory Setting

2.1 Federal

2.1.1 Clean Water Act

The Federal Water Pollution Control Act of 1972 (Clean Water Act) (33 USC 1251 et seq.), as amended by the Water Quality Act of 1987 (PL 100-4), is the major federal legislation governing water quality. The purpose of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." The definition of what constitutes "waters of the United States" (provided in 33 CFR Section 328.3(a)) has changed multiple times over the past 36 years starting with the United States v. Riverside Bayview Homes, Inc. court ruling in 1985. Subsequent court proceedings, rule makings, and congressional acts in 2001 (Solid Waste Agency of North Cook County v. United States Army Corps of Engineers), 2006 (Rapanos v. United States), 2015 (Waters of the United States [WOTUS] Rule), 2018 (suspension of the WOTUS Rule), and 2019 (formal repeal of the WOTUS Rule) have attempted to provide greater clarity to the term and its regulatory implementation. The most recent Navigable Waters Protection Rule (NWPR), issued by the U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE) in January 2020, defined "waters of the United States" to include the following four categories: (1) the territorial seas and traditional navigable waters; (2) tributaries of such waters; (3) certain lakes, ponds, and impoundments of jurisdictional waters; and (4) wetlands adjacent to other jurisdictional waters (other than waters that are themselves wetlands). However, this rule was remanded and vacated with the August 2021 decision in Pasqua Tribe et al v United States Environmental Protection Agency. As a result, the current administration is evaluating a new rulemaking process. In the meantime, the EPA and USACE have halted implementation of the NWPR nationwide and will revert to and apply the CWA 1986 definition and the 2008 Rapanos guidance, informally referred to as "the pre-2015 regulatory regime", until further notice. The term "wetlands" (a subset of waters) is defined in 33 CFR Section 328.3(b) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Discharges into waters of the United States and wetlands are regulated under Section 404 by the USACE.

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

Important applicable sections of the Clean Water Act are as follows:

- Section 401 requires an applicant for any federal permit for an activity that may result in a discharge of pollutants into waters of the United States to obtain certification from the state that the activity complies with all applicable water quality standards, limitations, and restrictions. Section 401 water quality certification is provided by the RWQCB and typically include conditions to minimize impacts on water quality.
- Section 402 establishes the National Pollutant Discharge Elimination System, a permitting system for municipal and industrial discharges of any pollutant (except for dredge or fill material) into waters of the United States. The National Pollutant Discharge Elimination System program establishes limits on allowable concentrations and mass emissions of pollutants contained in point source and non-point source

discharges. This program is administered by the RWQCB. Conformance with Section 402 is typically addressed in conjunction with water quality certification under Section 401.

- Section 404 provides for issuance of permits for the discharge of dredge or fill material into waters of the United States, including wetlands, by USACE. Two types of permits are issued by the USACE under Section 404: General Permits and Individual Permits. General Permits, which authorize groups activities with minimal impacts to an aquatic environment, can include Nationwide Permits, Regional General Permits, and Programmatic General Permits. Individual Permits are issued for projects that could cause significant impacts to an aquatic environment and require a lengthier public review process.

2.1.2 Federal Endangered Species Act

The FESA of 1973 (16 U.S.C. 1531 et seq.), as amended, is administered by the USFWS for most plant and animal species and by the National Oceanic and Atmospheric Administration National Marine Fisheries Service for certain marine species. This legislation is intended to provide a means to conserve the ecosystems upon which endangered and threatened species depend and to provide programs for the conservation of those species, thus preventing the extinction of plants and wildlife. Federal ESA defines an endangered species as "any species that is in danger of extinction throughout all or a significant portion of its range." A threatened species is defined as "any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." Under federal ESA, it is unlawful to take any listed species; "take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." As part of this regulatory act, federal ESA provides for designation of critical habitat, defined in federal ESA Section 3(5)(A) as specific areas within the geographical range occupied by a species where physical or biological features "essential to the conservation of the species" are found and that "may require special management considerations or protection." Critical habitat may also include areas outside the current geographical area occupied by the species that are nonetheless "essential for the conservation of the species." Critical habitat designations identify, with the best available knowledge, those biological and physical features (primary constituent elements) which provide for the life history processes essential to the conservation of the species.

FESA allows for the issuance of incidental take permits for listed species under Section 7, which is generally available for projects that also require other federal agency permits or other approvals, and under Section 10, which provides for the approval of habitat conservation plans (HCPs) on public or private property without any other federal agency involvement. The Proposed Project would overlap with the permit areas for three HCPs approved by the USFWS, two of which were co-developed by the City; these HCPs are described below.

Interim-Programmatic Habitat Conservation Plan for Mount Hermon June Beetle and Ben Lomond Spineflower

In June 2011, the USFWS, County of Santa Cruz, and City of Scotts Valley developed the *Interim-Programmatic Habitat Conservation Plan for the Endangered Mount Hermon June beetle and Ben Lomond Spineflower* (IPHCP) to cover eligible small development projects in densely developed residential neighborhoods that support habitat for the federally endangered Mount Hermon June beetle (*Polyphylla barbata*) and Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*). This IPHCP is intended to support issuance of two incidental take permits (ITPs) under section 10(a)(1)(B) of FESA that would authorize the County and the City of Scotts Valley to take Mount Hermon June beetle resulting from such activities. The County and the City of Scotts Valley would then extend their take coverage through Certificates of Inclusion to eligible landowners within their jurisdiction needing incidental take authorization associated with their small development projects.

The 10 Project Units within the IPHCP boundary were identified within the communities of Ben Lomond, Felton, Mount Hermon, and Scotts Valley. These Project Units range in size from 3.2 to 373 acres. Project Units include parcels in the vicinity of the Rolling Woods neighborhood, the Whispering Pines neighborhood, east and west Scotts Valley, Green Valley, Mount Hermon, Zayante Road, and Ben Lomond. The existing NCP abuts the Mount Hermon IPHCP Project Unit at the northern end of the Graham Hill Road North section and the Rolling Woods Project Unit at the southern end of the Graham Hill Road North section and northern end of the Graham Hill Road South section.

City of Santa Cruz Operations and Maintenance Habitat Conservation Plan

The City developed the Operations and Maintenance Habitat Conservation Plan (O&M HCP) for improvements or projects with the potential to take federally listed species and other non-listed special-status species. The USFWS approved and has issued an Incidental Take Permit (No. TE89655D-0) for the O&M HCP, which covers six wildlife and four plant species: Ohlone tiger beetle (*Cicindela ohlone*; federally endangered), Mount Hermon June beetle, tidewater goby (*Eucyclogobius newberryi*; federally endangered), Pacific lamprey (*Entosphenus tridentatus*; California Species of Special Concern), California red-legged frog (*Rana draytonii*; federally threatened), western pond turtle (*Emys marmorata*; California Species of Special Concern), robust spineflower (*Chorizanthe robusta* var. *robusta*; federally endangered), Santa Cruz tarplant (*Holocarpha macradenia*; federally threatened and state endangered), San Francisco popcorn flower (*Plagiobothrys diffusus*; state endangered), and Ben Lomond spineflower. The biological goals and objectives and conservation measures include restoring habitat temporarily disturbed, contributing to protected and managed lands that support covered populations, implementing bypass flows consistent with the Anadromous Salmonid HCP (currently being developed), pursuing other conservation actions that will result in conservation benefits, and implementing general and species-specific impact minimization measures and best management practices. The O&M HCP addresses upgrades to the North Coast Pipeline and rehabilitation of diversion structures, operation of existing City facilities, and operations and maintenance of existing water diversions and transmission lines and their associated features. The O&M HCP was recently finalized and the incidental take permit was issued by the USFWS in January 2021; the permit is effective through January 2051 (City of Santa Cruz 2021).

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

The City developed a low-effect HCP for the operations, maintenance, and construction activities associated with the GHWTP (GHWTP LEHCP; City of Santa Cruz 2013). The USFWS approved and has issued an Incidental Take Permit (No. TE15139B-0) for this low-effect HCP, which covers incidental take of Mount Hermon June beetle, Zayante band-winged grasshopper, and Ben Lomond spineflower as a result of all current and future operations, maintenance, and construction activities at the GHWTP. The HCP covers the entire 12.71 acres of the GHWTP property, and includes 5.7 acres of suitable habitat, and 0.88 acres of occupied habitat for these species. The conservation strategy emphasizes protection of habitat through impact avoidance and implementation of measures designed to minimize impacts to Mount Hermon June beetle. To mitigate for unavoidable impacts to Mount Hermon June beetle, the City has protected suitable and occupied sandhills habitat at its 17-acre Bonny Doon mitigation site and can purchase credits from the USFWS-approved Zayante Sandhills Conservation Bank. There are 11.3 acres remaining at the mitigation site to compensate for future impacts to Mount Hermon June Beetle and potentially other species which rely on sandhills habitat.

2.1.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) was originally passed in 1918 as four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. The primary motivation for the international negotiations was to stop

the "indiscriminate slaughter" of migratory birds by market hunters and others. The MBTA protects over 800 species of birds (including their parts, eggs, and nests) from killing, hunting, pursuing, capturing, selling, and shipping unless expressly authorized or permitted.

2.1.4 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BAGEPA) is the primary law protecting both bald and golden eagles. Specifically, BAGEPA prohibits "take" of eagles without a permit and defines take to include "pursue, destroy, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" and prohibits take of individuals, active nests, or eggs. The term "disturb" is further defined by regulation as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, injury to an eagle, a decrease in productivity, or nest abandonment" (50 CFR 22.3).

2.2 State

2.2.1 California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires identification of a project's potentially significant impacts on biological resources and ways that such impacts can be avoided, minimized, or mitigated. The act also provides guidelines and thresholds for use by lead agencies for evaluating the significance of proposed impacts.

CEQA Guidelines Section 15380(b)(1) defines endangered animals or plants as species or subspecies whose "survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors" (14 CCR 15380(b)(1). A rare animal or plant is defined in Section 15380(b)(2) as a species that, although not presently threatened with extinction, exists "in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or … [t]he species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered 'threatened' as that term is used in the federal Endangered Species Act." Additionally, an animal or plant may be presumed to be endangered, rare, or threatened if it meets the criteria for listing, as defined further in CEQA Guidelines Section 15380(c). For example, CDFW has concluded that plant species included on the California Native Plant Society's (CNPS) California Rare Plant Rank (CRPR) 1 and 2 lists are covered by CEQA Guidelines Section 15380.

The California Department of Fish and Wildlife (CDFW) has developed a list of "Special Animals" as "a general term that refers to all of the taxa the California Natural Diversity Database (CNDDB) is interested in tracking, regardless of their legal or protection status." This list includes many additional species beyond those protected under FESA, the California Endangered Species Act (CESA), and other California Fish and Game Code (CFGC) provisions, and incorporates lists developed by other conservation organizations, such as the North American Bird Conservation Initiative. Lists of sensitive species prepared by other agencies, including Bureau of Land Management and U.S. Forest Service Sensitive Species lists and USFWS' Birds of Conservation Concern, are also included.

CEQA Guidelines Section IV, Appendix G (Environmental Checklist Form), requires an evaluation of impacts to "any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service" (14 CCR 15000 et seq.). Sensitive natural communities are vegetation communities that are of limited distribution statewide or within a county or region. CDFW's Vegetation Classification and Mapping Program (VegCAMP) works to classify and map the vegetation of California and determine the rarity of vegetation types. Communities with a state rarity ranking of S1

through S3 in CDFW's Natural Community list (CDFW 2020) are considered highly imperiled, and project impacts on high-quality occurrences of these communities are typically considered significant under CEQA.

2.2.2 California Endangered Species Act

CESA (CFCG Section 2050 et seq.) provides protection and prohibits the take of plant, fish, and wildlife species designated by the Fish and Game Commission as endangered, candidate, or threatened in the State of California. Unlike FESA, state-listed plants have the same degree of protection as wildlife, but insects and other invertebrates may not be listed. Take under CESA is defined as any action or attempt to "hunt, pursue, catch, capture, or kill." Unlike FESA, CESA does not include harassment or harm (e.g., habitat loss or degradation) in its definition of take. Take is prohibited for both listed and candidate species. Take authorization for otherwise lawful activities may be obtained from the CDFW under Section 2081 of the CFGC. Project applicants consult with CDFW to develop an approved plan that minimizes and "fully mitigates" the impacts of the incidental take.

2.2.3 California Fish and Game Code

Fully Protected Species

CFGC Sections 3511, 4700, 5050, and 5515 identify fish, amphibian and reptile, bird, and mammal species, respectively, designated as fully protected in California. The classification of "fully protected" was the state's initial effort in the 1960s to identify and provide additional protection to those animals that were rare or faced possible extinction. Fully protected species may not be taken or possessed at any time, and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock. "Take" is defined as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

Lake or Streambed Alteration

Under CFGC Section 1602, CDFW has authority to regulate work that will substantially divert or obstruct the natural flow of or substantially change or use any material from the bed, channel, or bank of any river, stream, or lake. CDFW also has authority to regulate work that will deposit or dispose of debris, water, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. This regulation takes the form of a requirement for a Lake or Streambed Alteration Agreement and is applicable to any person, state, or local governmental agency or public utility (CFGC Section 1601). CDFW jurisdiction includes ephemeral, intermittent, and perennial watercourses (including dry washes) and lakes characterized by the presence of (1) definable bed and banks and (2) existing fish or wildlife resources. In practice, CDFW marks its jurisdictional limit at the top of the stream or lake bank or the outer edge of the riparian vegetation, where present, and sometimes extends its jurisdiction to the edge of the 100-year floodplain. Because riparian habitats do not always support wetland hydrology or hydric soils, wetland boundaries, as defined by Clean Water Act Section 404, sometimes include only portions of the riparian habitat adjacent to a river, stream, or lake. Therefore, jurisdictional boundaries under Section 1602 may encompass a greater area than those regulated under Clean Water Act Section 404; CDFW does not have jurisdiction over ocean or shoreline resources.

Sections 3503, 3511, 3513, 4150

CFGC Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. CFGC Section 3503.5 protects

all birds-of-prey (raptors) and their eggs and nests. Section 3511 states fully protected birds or parts thereof may not be taken or possessed at any time. Section 3513 states that it is unlawful to take or possess any migratory nongame bird as designated in the MBTA. All nongame mammals, including bats, are protected by CFGC Section 4150.

2.2.4 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act established the SWRCB and RWQCB as the principal state agencies responsible for the protection of water quality in California. The Central Coast Regional Water Quality Control Board (CCRWQCB) has regulatory authority over the Proposed Project. The Porter-Cologne Water Quality Control Act provides that "All discharges of waste into the waters of the state are privileges, not rights." Waters of the State are defined in Section 13050(e) of the Porter-Cologne Water Quality Control Act as "...any surface water or groundwater, including saline waters, within the boundaries of the state." All dischargers are subject to regulation under the Porter-Cologne Water Quality Control Act, including both point and nonpoint source dischargers. The CCRWQCB has the authority to implement water quality protection standards through the issuance of permits for discharges to waters at locations within its jurisdiction. As noted above, the CCRWQCB is the appointed authority for Clean Water Act Section 401 compliance of the Proposed Project.

2.2.5 California Native Plant Protection Act

The California Native Plant Protection Act of 1977 directed CDFW to carry out the Legislature's intent to "preserve, protect and enhance rare and endangered plants in this State." The Native Plant Protection Act gave the California Fish and Game Commission the power to designate native plants as "endangered" or "rare" and protect endangered and rare plants from take. CESA expanded on the original Native Plant Protection Act and enhanced legal protection for plants, but the Native Plant Protection Act remains part of the CFCG. To align with federal regulations, CESA created the categories of "threatened" and "endangered" species. It converted all "rare" animals into the act as threatened species, but did not do so for rare plants. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Because rare plants are not included in CESA, appropriate compensatory mitigation measures for significant impacts to rare plants are typically negotiated with the CDFW.

2.3 Local

California Government Code Section 53091 (d) and (e) provides that facilities for the production, generation, storage, treatment, and transmission of water supplies are exempt from local (i.e., county and city) building and zoning ordinances. The Proposed Project is critical to the operation, utilization, storage and transmission of water supplies, and, therefore, the Proposed Project is legally exempt from Santa Cruz County and City of Santa Cruz building and zoning ordinances. Where applicable and when feasible to meet project objectives, the Proposed Project would be constructed consistent with local policies and ordinances. This section describes local programs, policies, and regulations related to biological resources that may apply to the Proposed Project.

2.3.1 County of Santa Cruz General Plan and Local Coastal Program

The Santa Cruz County General Plan and Local Coastal Program (LCP) is a comprehensive, long-term planning document for the unincorporated areas of the County and includes the County's LCP, which was certified by the

California Coastal Commission in 1994 (County of Santa Cruz, 1994). The County General Plan and LCP provides policies and programs to establish guidelines for future growth and all types of physical developments.

The County's General Plan and LCP, Chapter 5 (Conservation and Open Space), Objective 5.2 (Riparian Corridors and Wetlands), establishes definitions for riparian corridors and wetlands to ensure their protection. Policies 5.2.1 through 5.2.5 identify and define riparian corridors and wetlands, determine the uses which are allowed in and adjacent to these habitats, and specify required buffer setbacks and performance standards for land in and adjacent to these areas. Riparian corridors are defined as (a) 50 feet from the top of a distinct channel or physical evidence of high water mark of perennial stream; (b) 30 feet from the top of a distinct channel or physical evidence of high water mark of an intermittent stream as designated on the General Plan maps and through field inspection of undesignated intermittent and ephemeral streams; (c) 100 feet of the high water mark of a lake, wetland, estuary, lagoon, or natural body of standing water; (d) the landward limit of a riparian woodland plant community; and (e) wooded arroyos within urban areas. The County definitions are consistent with those used for CEQA purposes.

The County's General Plan and LCP, Chapter 5 (Conservation and Open Space), Objective 5.1 (Biological Diversity), establishes definitions for sensitive habitats to ensure their protection. Policies 5.1.1 through 5.1.11 identify and define sensitive habitats, determine the uses which are allowed in and adjacent to these habitats, and specify performance standards for land in and adjacent to these areas.

The County's General Plan and LCP, Chapter 5 (Conservation and Open Space), Objective 5.12 (Timber Resources), describes lands to be designated for timber production to encourage economic production of forest products on a sustained yield basis under high environmental standards. Policies 5.12.1 through 5.12.14 identify and define permitted and conditional uses in timber production zones and specify performance standards for land in and adjacent to these areas.

The County's certified LCP is administered by the County Planning Department, pursuant to the California Coastal Act, and includes specific plans and ordinances for activities within the Coastal Zone. The LCP implementing ordinances in the County Code that are relevant to biological resources include the following:

- Grading Ordinance (Chapter 16.20)
- Erosion Control Ordinance (Chapter 16.22)
- Riparian Corridor and Wetlands Protection (Chapter 16.30)
- Sensitive Habitat Protection (Chapter 16.32)
- Significant Trees Protection (Chapter 16.34)

Because the proposed project does not occur within the Coastal Zone, it would not require compliance with the LCP, or the standards contained in the LCP implementing ordinances, nor would the proposed project require a Coastal Development Permit. While some of the above ordinances require separate approvals or permits (e.g., Riparian Exception), such approvals are not required for the Proposed Project, as it falls under California Government Code Section 53091 (d) and (e) and is legally exempt from Santa Cruz County building and zoning ordinances, as described above. The following implementing ordinances are described primarily for informational purposes, in addition to providing added context to the definition of sensitive resources for CEQA analysis.

2.3.1.1 Grading and Erosion Control Ordinances

Santa Cruz County Code Chapter 16.20, Grading Regulations, sets forth rules and regulations to control all grading, including excavations, earthwork, road construction, dredging, diking, fills, and embankments. Santa Cruz County Code Chapter 16.22 requires control of all existing and potential conditions of accelerated (human-induced) erosion, and sets forth required provisions for project planning, preparation of erosion control plans, runoff control, land clearing, and winter operations.

2.3.1.2 Riparian Corridor Protection Ordinance

Santa Cruz County Code Chapter 16.30, Riparian Corridor and Wetlands Protection, includes regulations to limit development activities in riparian corridors. The regulations provide that "no project shall undergo developmental activities in riparian corridors or areas with urban or rural service lines which are within a buffer zone as measured from the top of the arroyo." Buffer areas are specified in the regulations and are determined from characteristics found in the riparian area, including average slope within 30 feet of water's edge, vegetation, and stream characteristics. The buffer always extends 50 feet from the edge of riparian woodland and 20 feet beyond the edge of other woody vegetation, as determined by the dripline. After the buffer is determined, a 10-foot setback from the edge of the buffer is required for all structures, which allows construction equipment and use of a yard area. Exceptions and conditioned exceptions to the provisions of this code may be authorized. Findings meeting the following criteria define the circumstances necessary in granting an exception to the above requirements:

1. That there are special circumstances or condition affecting the property.
2. That the exception is necessary for the proper design and function of some permitted or existing activity on the property.
3. That the granting of the exception will not be detrimental to the public welfare or injurious to other property downstream or in the area in which the project is located.
4. That the granting of the exception, in the Coastal Zone, will not reduce or adversely impact the riparian corridor, and there is no feasible less environmentally damaging alternative.
5. That the granting of the exception is in accordance with the purpose of this chapter, and with the objectives of the General Plan and elements thereof, and the Local Coastal Program Land Use Plan.

2.3.1.3 Sensitive Habitats Protection Ordinance

Santa Cruz County Code Chapter 16.32 regulates development in or adjacent to specified environmentally sensitive habitat areas. An area defined as "sensitive habitat" under this ordinance includes various criteria, and includes all lakes, wetlands, estuaries, lagoons, streams, rivers, and riparian corridors. No development activity may occur within an area of biotic concern unless approval is issued or unless the activity is reviewed concurrently with the review of an associated development or land division application. All development within environmentally sensitive habitat must be mitigated or restored. The following findings are necessary in granting an exception to the provisions and requirements of this ordinance:

1. that adequate measures will be taken to ensure consistency with the purpose of this chapter to minimize the disturbance of sensitive habitats; and
2. one of the following situations exists:
    a. the exception is necessary for restoration of a sensitive habitat; or

b. it can be demonstrated by biotic assessment, biotic report, or other technical information that the exception is necessary to protect public health, safety, or welfare.

Any development activity that has received a riparian exception according to the provisions of Santa Cruz County Code Chapter 16.30 would not be subject to this chapter.

2.3.2 City of Santa Cruz City-Wide Creeks and Wetlands Management Plan

Activities within the City limits that occur along or adjacent to riparian areas are regulated by the *City-wide Creeks and Wetlands Management Plan* (Creeks Plan; City of Santa Cruz 2008). The Creeks Plan was adopted by the City Council to provide a comprehensive approach to managing all creeks and wetlands within the City. The Plan recommends specific setback requirements based on biological, hydrological, and land use characteristics for various watercourse types within the City. The recommended setbacks within a designated management area include a riparian corridor setback and a development setback area; an additional area extends from the outward edge of the development area to the outer edge of the management area. The Management Plan outlines a process for permitting development adjacent to watercourses. Projects that require a Watercourse Development Permit would be subject to the provisions in Chapter 24.08, Part 21 of the City's Municipal Code (Zoning Regulations) that pertain to issuance of these permits. The Plan and zoning regulations include specified development standards and management guidelines. It should be noted that repair, maintenance, or minor alteration of existing public utilities or projects that are reviewed and approved under another authorizing permitting agency (USACE, RWQCB, and/or CDFW) are exempt from City permit requirements.

The only portion of the BSA that occurs within the City limits is the GHWTP parcel located immediately adjacent and to the west of the terminus of the Graham Hill Road South section. The nearest drainage to this portion of the BSA is the San Lorenzo River, which occurs approximately 1,000 feet to the west of the Proposed Project work area. The Creeks Plan does not identify any riparian corridors or setbacks associated with the San Lorenzo River within the BSA.

3 Methods

Data regarding biological resources present within the 982.82-acre BSA were obtained through a review of pertinent literature, field reconnaissance, an aquatic resources jurisdictional delineation, and habitat assessments, which are described in detail below. For purposes of this report, special-status biological resources are defined as follows:

- Special-status plant species include (1) species designated as either rare, threatened, or endangered by CDFW or USFWS and are protected under either CESA (CFCG 2050 et seq.) or FESA (16 USC 1531 et seq.); (2) species that are candidate species being considered or proposed for listing under CESA or FESA; (3) species that are included on the CDFW Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2021a) or species with a CRPR of 1 or 2 in the CNPS Inventory of Rare and Endangered Plants of California (CNPS Inventory; CNPS 2021); or (4) species given protection under the County's General Plan/Local Coastal Program and applicable ordinances.
- Special-status wildlife species include (1) fish or wildlife species listed, proposed for listing, or candidates for listing as threatened or endangered by the USFWS under FESA (16 USC 1531 et seq.); (2) fish or wildlife species listed as threatened or endangered, or proposed for listing, under CESA (CFCG, Section 2050 et seq.); (3) fish or wildlife species designated by the CDFW as "Species of Special Concern" (SSC) as indicated on the CDFW Special Animals List (CDFW 2021b); (4) wildlife designated as fully protected species under Sections 3511, 4700, 5050, and 5515 the California Fish and Game Code; and (5) species that meet the definition of rare, threatened, or endangered as described in the CEQA Guidelines, Section 15380.
- Sensitive vegetation communities include (1) those designated as sensitive by CDFW and assigned state ranks of S1-S3 based on their rarity and threats (CDFW 2020), (2) those that provide habitat for special-status species, or (3) those designated as sensitive by the County of Santa Cruz within Chapter 5 of the General Plan and County Code Title 16.
- Jurisdictional aquatic resources subject to the permitting authority of the USACE, CCRWQCB, and CDFW.
- Wildlife corridors and habitat linkages as identified in the *Critical Linkages: Bay Area and Beyond* project report (Penrod et al. 2013) as well as applicable datasets (Penrod 2014a, 2014b) in CDFW's BIOS viewer (version 5.89.14c) and general species' life history literature.

3.1 Literature Review

Prior to field surveys, special-status biological resources present or potentially present within the BSA were identified through queries of the County of Santa Cruz Online GIS database (County of Santa Cruz 2021), CNDDB (CDFW 2021c), USFWS Information for Planning and Consultation (IPaC) website (USFWS 2021), CNPS Inventory of Rare and Endangered Plants of California (CNPS Inventory) (CNPS 2021), and U.S. Department of Agriculture Web Soil Survey (USDA 2021a). The CNPS Inventory and CNDDB were queried based on the U.S. Geological Survey 7.5-minute quadrangle in which the BSA is located (Felton) and the seven surrounding quadrangles (Big Basin, Castle Rock Ridge, Los Gatos, Davenport, Laurel, Santa Cruz, and Soquel). The IPaC databases was queried using GIS software based on a 1-mile buffer around the BSA.

General information regarding wildlife species distribution in the region and potential presence within the BSA was primarily obtained from Cornell Lab of Ornithology (2021) for birds, Hall (1981) for mammals, and Stebbins (2003) for reptiles and amphibians. To identify "established native resident or migratory wildlife movement corridors" that could be impacted by the Proposed Project, biologists reviewed the Critical Linkages: Bay Area and Beyond project

report (Penrod et al. 2013) as well as applicable datasets (Penrod 2014a, 2014b) in CDFW's BIOS viewer (version 5.89.14c).

3.2 Field Surveys

From December 2020 to February 2021, Dudek conducted reconnaissance-level biological surveys of the BSA that included vegetation community and land cover mapping, focused habitat assessments for special-status plant and wildlife species, and an aquatic resources jurisdictional delineation. Table 2 lists the dates, focus, scope, conditions, and personnel for each survey, and Appendix A, Site Photographs, provides representative photographs taken during the survey efforts. Additional information on each survey type is provided below.

Table 2. Summary of Biological Surveys

Date	Time	Type of Survey	Survey Conditions	Biologists
12/02/2020	0830–1620	Biological reconnaissance survey, vegetation mapping, special-status species habitat assessments, Sandhills habitat assessment	43°F–55°F, 15%–20% CC, 0–5 mph wind	ES, JMc
12/09/2020	0900–1630	Biological reconnaissance survey, vegetation mapping, special-status species habitat assessments	46°F–60°F, 10%–40% CC, 0–5 mph wind	ES
01/07/2021	0800–1700	Sandhills habitat assessment	46°F–59°F, 50%–100% CC, 0–6 mph wind	JMc
01/25/2021	1030–1730	Biological reconnaissance survey, vegetation mapping, special–status species habitat assessments	45°F –50°F, 15%-70% CC, 5–15 mph wind	ES, ML, MR
02/03/2021	0830–1700	Biological reconnaissance survey, vegetation mapping, special–status species habitat assessments	41°F –57°F, 0%-15% CC, 5–8 mph wind	ML
02/03/2021	0830–1700	Aquatic resources jurisdictional delineation	41°F –57°F, 0%–15% CC, 5-8 mph wind	EG, SL
02/04/2021	0830–1700	Aquatic resources jurisdictional delineation	42°F –58°F, 0%–15% CC, 0–5 mph wind	EG, SL
04/19/2021	0800–1700	Special-status plant survey (pass 1)	52°F –64°F, 0%–20% CC, 2–10 mph wind	JMc
04/21/2021	0800–170	Special-status plant survey (pass 1)	53°F –64°F, 0%–20% CC, 2–15 mph wind	JMc
04/22/2021	0800–1700	Special-status plant survey (pass 1)	52°F –62°F, 0%–20% CC, 2–15 mph wind	JMc
06/03/2021	0800–1700	Special-status plant survey (pass 2)	57°F –80°F, 0%–20% CC, 0–5 mph wind	JMc
06/04/2021	0800–1700	Special-status plant survey (pass 2)	61°F –72°F, 40%–80% CC, 0–5 mph wind	JMc
07/14/2021	0800–1700	Special-status plant survey (pass 3)	59°F –75°F, 0%–20% CC, 0–10 mph wind	JMc
07/15/2021	0800–1700	Special-status plant survey (pass 3)	58°F –70°F, 20%–40% CC, 0–10 mph wind	JMc

Survey Conditions: °F = degrees Fahrenheit; CC = cloud cover; mph = miles per hour.
Biologists: EG = Elizabeth Geisler; ES = Emily Scricca; JMc = Jodi McGraw; ML = Michele Laskowski; MR = Matt Ricketts; SL = Sheldon Leiker.

3.2.1 Vegetation Communities and Land Covers

Dudek used CDFW's Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities (CDFW 2018) and the California Natural Communities List (CDFW 2020) to map vegetation in the BSA. Vegetation communities and land covers were delineated to the vegetation alliance level and, where appropriate, to the association level.

Vegetation communities and land covers were mapped in the field directly onto a 1:2,400-scale (1 inch = 200 feet), aerial-photograph-based field map of the BSA. A minimum mapping unit of 2.2 acres (1 hectare) was established to standardize the mapping protocol among biologists. A Dudek GIS analyst processed the vegetation boundaries as delineated by the field biologists and created a GIS coverage for vegetation communities using ArcGIS software. Once major linework and community designations were completed, a geodatabase was created to help ensure the data was topologically correct and met final quality assurance/quality control procedures.

3.2.2 Plant and Wildlife Species

All plant species observed during field surveys were identified and recorded. Latin and common names for plant species with a CRPR follow the nomenclature set forth in the CNPS Inventory (CNPS 2021). For plant species without a CRPR, Latin names follow the Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California (Jepson Flora Project 2021), and common names follow the California Natural Community List (CDFW 2020) or the USDA Natural Resources Conservation Service PLANTS Database (USDA 2021b).

Wildlife species detected during field surveys by sight, calls, tracks, scat, or other signs were recorded. Binoculars were used to aid in the identification of observed wildlife throughout the BSA. In addition to species directly observed, expected wildlife use was determined by known habitat preferences of local species and knowledge of their range and relative distributions in the area.

Sources for common and scientific names used for wildlife include Crother (2012) for reptiles and amphibians, the American Ornithological Society's checklist (Chesser et al. 2020) for birds, Wilson and Reeder (2005) for mammals, North American Butterfly Association (NABA 2001) for butterflies, and Moyle (2002) for fish.

3.2.3 Sandhills Habitat Assessment

The Santa Cruz Sandhills is a unique habitat type that only occurs on outcrops of the Zayante sands soil type in central Santa Cruz County and is known to support several special-status plant and wildlife species, including state- and federally-listed species. This endemic ecosystem provides habitat for species such as the Mount Hermon June beetle (*Polyphylla barbata*), Zayante band-winged grasshopper (*Trimerotropis infantilis*), Scotts Valley spineflower (*Chorizanthe robusta var. hartwegii*), and Santa Cruz wallflower (*Erysimum teretifolium*). Jodi McGraw Consulting (JMc) mapped areas of Sandhills habitat within the BSA. The goal of the assessment was to evaluate the occurrence of Sandhills habitat to assist with the analysis of biological resource impacts for CEQA and future permitting purposes. This section summarizes the results of the full habitat assessment for the BSA.

JMc reviewed existing documents and spatial datasets pertaining to the Sandhills ecosystem and associated vegetation communities and species occurrences, including their in-house GIS datasets (McGraw 2005a, 2005b, unpublished data), CNDDB (CDFW 2021c), U.S. Department of Agriculture Web Soil Survey (USDA 2021a), and aerial imagery (County of Santa Cruz 2016). In addition to the spatial data, JMc also reviewed information contained

in prior reports and plans assessing Sandhills habitat, including the Sandhills Conservation and Management Plan (McGraw 2004) and other survey reports prepared for other conservation and land use projects in the region.

Following the data review, JMc conducted a field assessment of the legally accessible areas of the BSA. The field assessment was used to delineate the Sandhills ecosystem and to aid classification and mapping of Sandhills communities within the BSA. The field assessment did not constitute a focused botanical survey, but any special-status plants encountered were recorded. The Sandhills Habitat Assessment is provided in Appendix B to this report.

3.2.4 Focused Botanical Surveys

Based on the habitat types present within and adjacent to the BSA, focused surveys for special-status plants were deemed necessary to support the analysis of potential impacts resulting from the Proposed Project. JMc conducted focused surveys for special-status plants within the BSA from April to July 2021 to maximize detection of species during their blooming periods. Three survey passes were conducted within potential habitat for target special-status plant species identified during the general biological survey and habitat assessments described above. The survey passes were conducted within the Proposed Project work area for the three pipeline segments with the highest priority for replacement: Brackney North, Graham Hill Road North, and Graham Hill Road South The Proposed Project work area constitutes the portion of the BSA in which all construction activities and staging would occur for these high priority segments. Field survey methods conformed to the CNPS Botanical Survey Guidelines (CNPS 2001); Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018); and Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants (USFWS 2000). All plant species encountered during the field surveys were identified to subspecies or variety, as applicable, to determine sensitivity status. If target species were encountered, field biologists recorded data points demarcating individual occurrences and/or edge of polygon(s) using a GPS receiver with sub-meter accuracy along with a data dictionary and assessed population numbers. The data dictionary included the species name, the number or range of individuals, and the biologist collecting the data. The focused botanical survey report is provided in Appendix C to this report.

3.2.5 Potential Jurisdictional Aquatic Resources

Prior to fieldwork, Dudek biologists conducted a desktop review of potentially jurisdictional aquatic resources (waters of the United States, waters of the state, and CFGC Section 1602 jurisdiction) within the BSA that could present constraints to the Proposed Project. This screening step involved review of existing data sources and was intended to eliminate areas of the Proposed Project from further analysis and field investigation. Potential and/or historic drainages and aquatic features were investigated based on a review of the following: USGS topographic maps (1:24,000 scale), aerial photographs, National Hydrography Dataset (NHD), the National Wetlands Inventory database (USFWS 2021), and the Natural Resources Conservation Service Web Soil Survey (USDA 2021a). In addition, hydrologic information from gauge stations within the vicinity of the BSA was obtained.

Dudek then ground-truthed results of the desktop screening for jurisdictional aquatic resources during the general biological field investigation described above. As part of the ground-truth effort, Dudek biologists documented potential aquatic resources with photographs and notes, including the estimated extent of the features. Observations within the BSA were conducted on foot except for inaccessible areas of Graham Hill Road, where a windshield assessment was performed. Results of the planning-level screening and field investigation were evaluated by the project team for review and design consideration. A Dudek GIS analyst processed the aquatic

resource extents documented by the biologists and created a GIS map of potential aquatic features using ArcGIS software. Survey Limitations

Vegetation community mapping and biological reconnaissance surveys were conducted during the winter season, which resulted in detection and identification of most perennial plant species that may occur in the BSA. Due to the timing of the surveys, annual species that bloom in spring, summer, and early fall, as well as cryptic perennials, may not have been detectable.

The botanical survey occurred in the second of two years of below-average rainfall. In Boulder Creek California, 2019-20 saw just 21.4 inches of rain, which is just 42 percent of the average 51.5 inches per year; 2020-21 received just 17 inches (33% of average; SLVWD 2021). Such drought conditions can limit establishment and survivorship of rare plants, particularly annual plants. An additional botanical survey after a "normal" rainfall year may be warranted to confirm special-status plant absence from the Proposed Project footprint after it has been defined.

Limitations of the surveys also include a diurnal bias for most wildlife, seasonal bias for resident and wintering birds, and the absence of focused trapping for small mammals, reptiles, and amphibians. The surveys were conducted during the daytime to maximize the detection of most wildlife. Birds represent the largest component of the vertebrate fauna and because most are active in the daytime, diurnal surveys maximize the number of bird observations. Conversely, diurnal surveys usually result in few observations of mammals, many of which may only be active at night. In addition, many species of reptiles and amphibians are secretive in their habits and are difficult to observe using standard meandering transects. Because surveys were conducted in the winter, non-resident birds that migrate through or nest in the area (e.g., Neotropical-Nearctic migrant landbirds) would not have been present.

The biological reconnaissance survey, vegetation mapping, habitat assessments, and the aquatic resources jurisdictional delineation were conducted within the BSA from the existing easements and publicly accessible roads and ROW. However, access was not available for all parcels within the BSA due to private residential properties. Therefore, use of aerial imagery signatures for vegetation communities and habitat suitability adjacent to the ROW within the BSA were conducted for those areas that could not be accessed on foot.

4 Results

4.1 Vegetation Communities and Land Covers

The BSA supports a total of 17 natural vegetation communities and 5 land covers. Figures 3-1 to 3-18 illustrate the distribution of vegetation communities and land covers for the northern and southern segments, respectively. Table 3 summarizes the extent of vegetation communities and land covers within the BSA. Descriptions of these vegetation communities and land covers are summarized below.

Table 3. Vegetation Communities and Land Covers within the Biological Study Area

Vegetation Alliance (Common Name) or Land Cover	CDFW CA Code	Area (acres)
Forest and Woodland Alliances and Stands		
Bigleaf maple forest and woodland (BMFW)	61.450.00	2.7
Black cottonwood forest and woodland (BCFW)	61.120.00	1.8
Box-elder forest and woodland (BFW)	61.440.00	2.4
California bay forest and woodland (CBFW)	74.100.00	20.9
California sycamore woodland (CSW)	61.310.00	12.0
Coast live oak woodland and forest (CLO)	71.060.00	90.1
Douglas fir - tanoak forest and woodland (DF-TFW)	82.500.00	4.5
Douglas fir forest and woodland (DFFW)	82.200.00	43.6
Mixed oak forest and woodland (MOFW)	71.100.00	54.9
Ponderosa pine forest and woodland (PPFW)	87.010.00	125.0
Redwood forest and woodland (RFW)	86.100.00	186.4
White alder groves (WAG)	61.420.00	13.8
Subtotal Forest and Woodland Alliances and Stands	-	*558.1*
Shrubland Alliances and Stands		
Coastal brambles (COB)	63.901.00	0.4
Coyote brush scrub (CYS)	32.060.00	6.5
Poison oak scrub (POS)	37.940.00	1.9
Silverleaf manzanita chaparral (SMC)	37.320.00	44.0
Subtotal Shrubland Alliances and Stands	-	*52.8*
Herbaceous Alliances and Stands		
Wild oats and annual brome grasslands (WOABG)	42.027.00	7.1
Subtotal Herbaceous Alliances and Stands	-	*7.1*
Non-natural Land Covers/Unvegetated Communities		
Dirt Road (DRD)	-	3.4
Disturbed Habitat (DH)	-	40.7
Parks (PARK)	-	4.9
Rural residential (DEV-RR)	-	230.4
Urban/Developed (DEV)	-	85.7
Subtotal Non-Natural Land Covers/Unvegetated Communities	-	*365.1*
Total	**-**	**983.1**

4.1.1 Forest and Woodland Alliances

4.1.1.1 Bigleaf Maple Forest and Woodland

The bigleaf maple forest and woodland alliance is characterized by bigleaf maple (*Acer macrophyllum*) being dominant or co-dominant in the tree canopy. This alliance has an intermittent to continuous canopy less than 246 feet in height (and may be two-tiered), with an infrequent or well-developed shrub layer (Sawyer et al. 2009). The herbaceous layer can vary from sparse to abundant. Species associated with the bigleaf maple forest and woodland alliance include California bay (*Umbellularia californica*), California black oak (*Quercus kelloggii*), canyon live oak (*Quercus chrysolepis*), Douglas fir (*Pseudotsuga menziesii*), incense cedar (*Calocedrus decurrens*), Pacific dogwood (*Cornus nuttallii*), Pacific yew (*Taxus brevifolia*), redwood (*Sequoia sempervirens*), valley oak (*Quercus lobata*), and white alder (*Alnus rhombifolia*).

Within the BSA, this vegetation community consists of bigleaf maple, California bay, Pacific madrone (*Arbutus menziesii*) and redwood. Understory plants include snowberry (*Symphoricarpos mollis*), toyon (*Heteromeles arbutifolia*), French broom (*Genista monspessulana*), California blackberry (*Rubus ursinus*), poison oak (*Toxicodendron diversilobum*), California man-root (*Marah fabacea*) and sword fern (*Polystichum munitum*). The bigleaf maple forest and woodland occurs along the San Lorenzo River corridor in the Brackney North and South sections of the pipeline and throughout the BSA, including the Newell Creek Road section, along significant drainages such as Newell Creek.

4.1.1.2 Black Cottonwood Forest and Woodland

The black cottonwood forest and woodland alliance is characterized by black cottonwood (*Populus trichocarpa*) being dominant or co-dominant in the tree canopy. This alliance has an intermittent to continuous canopy less than 98 feet in height with an open to continuous shrub layer (Sawyer et al. 2009). The herbaceous layer can vary from sparse to abundant. Species associated with the black cottonwood forest and woodland alliance in the Coast Range include arroyo willow (*Salix lasiolepis*), bigleaf maple, box-elder (*Acer negundo*), California sycamore (*Platanus racemosa*), coast live oak (*Quercus agrifolia*), coastal dune willow (*Salix hookeriana*), red alder (*Alnus rubra*), red willow (*Salix laevigata*), sandbar willow (*Salix exigua*), shining willow (*Salix lasiandra* var. *lasiandra*), wax myrtle (*Morella californica*), and white alder.

Within the BSA, this vegetation community consists of black cottonwood with California sycamore, California bay, box elder, big-leaf maple. The understory contains California blackberry, periwinkle (*Vinca major*), and English ivy (*Hedra helix*). This alliance primarily occurs within the Graham Hill Road North section of the BSA.

4.1.1.3 Box-elder Forest and Woodland

The box-elder forest and woodland alliance is characterized by box-elder being dominant or co-dominant in the tree canopy. This alliance has an intermittent to continuous canopy less than 66 feet in height with an open to intermittent shrub layer (Sawyer et al. 2009). The herbaceous layer can vary from sparse to abundant. Species associated with the box-elder forest and woodland alliance include black cottonwood, California sycamore, Fremont cottonwood (*Populus fremontii*), Goodding's willow (*Salix gooddingii*), Northern California black walnut (*Juglans hindsii*), Oregon ash, valley oak, and white alder.

Within the BSA, this vegetation community consists of box-elder, white alder, black cottonwood, arroyo willow, California sycamore, red osier dogwood (*Cornus sericea ssp. sericea*), and acacia (*Acacia dealbata*). This alliance primarily occurs within the Graham Hill Road North section of the BSA.

4.1.1.4 California Bay Forest and Woodland

The California bay forest and woodland alliance is characterized by California bay being dominant or co-dominant in the tree canopy. This alliance has an intermittent to continuous canopy less than 66 feet in height with an open to intermittent shrub layer (Sawyer et al. 2009). The herbaceous layer can vary from sparse to abundant. Species associated with the California bay forest and woodland alliance include beaked hazelnut (*Corylus cornuta*), bigleaf maple, California buckeye (*Aesculus californica*), California sycamore, coast live oak, Douglas fir, foothill pine (*Pinus sabiniana*), interior live oak (*Quercus wislizeni*), Pacific madrone, red alder, redwood, Southern California black walnut (*Juglans californica*), tanoak (*Notholithocarpus densiflorus*), and white alder.

Within the BSA, this vegetation community consists of California bay, coast live oak, bigleaf maple, redwood, acacia, poison oak, California blackberry, lady fern (*Athyrium filix-femina*), sword fern and polypody fern (*Polypodium californicum*). Some areas were characterized by open, sandy, landslide areas with French broom and California blackberry. This alliance is most common in the San Lorenzo River and Zayante Creek riparian corridors and is often adjacent to coast live oak woodland and redwood forest communities. Other locations where it occurs in the BSA include the Brackney North, Brackney South, Henry Cowell Redwoods State Park, Newell Creek Road, and San Lorenzo Way sections.

4.1.1.5 California Sycamore Woodland

The California sycamore woodland alliance is characterized by California sycamore and/or coast live oak being dominant or co-dominant in the tree canopy, which is less than 115 feet in height with a variable shrub layer and sparse or grassy herbaceous layer (Sawyer et al. 2009). The California sycamore woodland often occurs in gullies or along streams, springs, seeps, and associated terraces where floodplains are subject to high-intensity flooding.

Within the BSA, the California sycamore woodland forms an open to intermittent tree layer dominated by California sycamore in association with coast live oak, California bay, and box elder. The understory often has big-leaf maple, California blackberry, canyon gooseberry (*Ribes menziesii*) and cow parsnip (*Heracleum maximum*). The California sycamore woodland alliance is typically associated with significant drainages and occurs within the Felton Pump Station and San Lorenzo Way sections of the BSA.

4.1.1.6 Coast Live Oak Woodland and Forest

The coast live oak woodland alliance is characterized by coast live oak being dominant or co-dominant in the tree canopy. This alliance has an open to continuous canopy less than 98 feet in height, with a sparse to intermittent shrub canopy and a sparse or grassy ground layer (Sawyer et al. 2009). Species associated with the coast live oak woodland alliance include bigleaf maple, blue oak (*Quercus douglasii*), box elder, California bay, Engelmann oak (*Quercus engelmannii*), California sycamore, Southern California black walnut, valley oak, arroyo willow, California black oak, and Pacific madrone (Sawyer et al. 2009).

Within the BSA, this vegetation community consists of coast live oak, California bay, Pacific madrone, Douglas fir and ponderosa pine. Other species observed in the understory included coyote brush (*Baccharis pilularis*), poison oak, bracken fern (*Pteridium aquilinum var. pubescens*), California blackberry, and French broom. Where this

community occurred along riparian corridors the understory included species such as giant chain fern (*Woodwardia fimbriata*), sword fern, lady fern, pink honeysuckle (*Lonicera hispidula*), horsetail (*Equisetum sp.*), red elderberry (*Sambucus racemosa*), cow parsnip and hedge nettle (*Stachys sp.*). This alliance is relatively common and occurs in all sections of the BSA except the Brackney North and Santa Cruz Lumber Yard sections.

4.1.1.7 Douglas Fir – Tanoak Forest and Woodland

The Douglas fir-tanoak forest and woodland alliance is characterized by Douglas fir and tanoak being co-dominant in the tree canopy. This alliance has an intermittent to continuous canopy less than 246 feet in height, with a sparse to intermittent shrub canopy and a sparse to abundant herbaceous layer (Sawyer et al. 2009). Species associated with the Douglas fir-tanoak forest and woodland alliance include bigleaf maple, California bay, California black oak, canyon live oak, golden chinquapin (*Chrysolepis chrysophylla*), incense cedar, Pacific madrone, Pacific yew, Ponderosa pine (*Pinus ponderosa*), Port Orford cedar (*Chamaecyparis lawsoniana*), and sugar pine (*Pinus lambertiana*).

Within the BSA, this vegetation community consists of Douglas fir and tanoak dominant canopy together with Pacific madrone, coast live oak and Shreve oak (*Quercus parvula ssp. shrevei*). The understory consists of California huckleberry (*Vaccinium ovatum*), wood rose (*Rosa gymnocarpa*), California blackberry, poison oak, and sword fern. This alliance was limited in distribution and only occurs within the Pipeline Road section of the BSA.

4.1.1.8 Douglas Fir Forest and Woodland

The Douglas fir forest and woodland alliance is characterized by Douglas fir being the dominant or co-dominant with other hardwood trees in the canopy. This alliance has an intermittent to continuous canopy less than 246 feet in height, with a shrub layer that varies from infrequent to common and herbaceous layer that varies between sparse to abundant (Sawyer et al. 2009). Species associated with the Douglas fir forest and woodland alliance in the Coast Range include bigleaf maple, California black oak, coast live oak, golden chinquapin, incense cedar, Pacific madrone, Pacific dogwood, Port Orford cedar, redwood, sugar pine, white alder, and white fir (*Abies concolor*).

Within the BSA, this vegetation community consists of Douglas fir associated with redwood, knobcone pine (*Pinus attenuata*), coast live oak, and Pacific madrone. Understory plants included tanoak, California coffee berry (*Frangula californica*), ocean spray (*Holodiscus discolor*), wood rose, coyote brush, bracken fern, sword fern, Douglas iris (*Iris douglasiana*), yerba buena (*Satureja douglasiana*). This alliance is relatively common and occurs within the Brackney North Section, Brackney South, Graham Hill Road South, Henry Cowell Redwoods State Park, and Pipeline Road sections of the BSA.

4.1.1.9 Mixed Oak Forest and Woodland

The mixed oak forest and woodland alliance is characterized by a co-dominance of three or more oak species (*Quercus agrifolia*, *Quercus douglasii*, *Quercus garryana*, *Quercus kelloggii*, *Quercus lobata*, *and Quercus wislizeni*) in the tree canopy (Sawyer et al. 2009). The alliance has an intermittent to continuous canopy less than 98 feet in height with an infrequent to common shrub canopy, and a variable herbaceous layer (Sawyer et al. 2009). Other tree species associated with the alliance include California bay, California buckeye, Douglas fir, and Pacific madrone.

Within the BSA, this vegetation community consists of coast live oak and interior live oak as co-dominants with some redwood, ponderosa pine, Pacific madrone, and California bay. The understory includes Douglas fir, black cottonwood, arroyo willow, buckeye, tanoak, California coffee berry, coyote brush, toyon, hairy manzanita, pointleaf manzanita, California goldenbush. Other species included rushes (*Juncus sp*.), rattlesnake grass (*Briza maxima*), autumn hawkbit (*Scorzoneroides autumnalis*), broad-leaved helleborine (*Epipactis helleborine*), California yerba santa (*Eriodictyon californicum*), and sticky monkey flower. This alliance is relatively common and occurs within the Brackney North, Henry Cowell Redwoods State Park, Newell Creek Road, Pipeline Road, San Lorenzo Way, and the Santa Cruz Lumber Yard sections of the BSA.

4.1.1.10 Ponderosa Pine Forest and Woodland

The Ponderosa pine forest alliance is characterized by Ponderosa pine being dominant or co-dominant in the tree canopy. The alliance has an open to continuous canopy less than 164 feet in height with an open to continuous shrub layer and a sparse, abundant, or grassy herbaceous layer (Sawyer et al. 2009). Species associated with the alliance in the Coast Range include California black oak, canyon live oak, Coulter pine (*Pinus coulteri*), Douglas fir, incense cedar, Jeffrey pine (*Pinus jeffreyi*), lodgepole pine (*Pinus contorta* ssp. *murrayana*), mountain juniper (*Juniperus grandis*), sugar pine, tanoak, western juniper (*Juniperus occidentalis*), and white fir.

Within the BSA, this vegetation community consists of Ponderosa pine associated with Douglas fir, coast live oak, and Pacific madrone. The understory consists primarily of California coffee berry, poison oak, California blackberry, and bracken fern. Shrubs that comprise the silverleaf manzanita chapparal alliance were found within canopy gaps and the understory of some locations. This alliance occurs within the Graham Hill Road North, Graham Hill Road South, and Pipeline Road sections of the BSA.

4.1.1.11 Redwood Forest and Woodland

The redwood forest alliance is characterized by redwood being dominant or co-dominant in the tree canopy. The alliance has a continuous to intermittent canopy less than 400 feet in height with an infrequent to common shrub canopy and a variable herbaceous layer (Sawyer et al. 2009). Species associated with the alliance include bigleaf maple, California bay, red alder, giant chinquapin, tanoak, Douglas fir, and Pacific madrone among others (Sawyer et al. 2009).

Redwood forest and woodland is the most common alliance in the BSA. This vegetation community consisted of redwood and California bay as co-dominants, with some coast live oak and Douglas fir. The understory is characterized by bigleaf maple, tanoak, beaked hazelnut, thimbleberry (*Rubus parviflorus*), California blackberry, English ivy, sword fern, creeping wood sorrel (*Oxalis corniculata*), broadleaf forget me-not (*Myositis latifolia*), hairy fleabane (*Erigeron bonariensis*), rushes, greater periwinkle, pink honeysuckle, and redwood sorrel (*Oxalis oregana*). This alliance occurs in all sections of the BSA except the Felton Pump Station or Santa Cruz Lumber Yard sections.

4.1.1.12 White Alder Groves

The white alder groves alliance is characterized by white alder being dominant or co-dominant in the tree canopy. The alliance has a continuous to intermittent canopy less than 400 feet in height with an infrequent to common shrub canopy and a variable herbaceous layer (Sawyer et al. 2009). Species associated with the alliance include bigleaf maple, California bay, red alder, giant chinquapin, tanoak, Douglas fir, and Pacific madrone among others (Sawyer et al. 2009).

Within the BSA, this vegetation community consists of white alder often associated with California sycamore, black cottonwood, and bigleaf maple. Typical understory species include thimbleberry, California blackberry and ferns. This alliance occurs in the Felton Pump Station, Graham Hill Road North, Henry Cowell Redwoods State Park, Newell Creek Road, and Pipeline Road sections of the BSA.

4.1.2 Shrubland Alliances and Stands

4.1.2.1 Coastal Brambles

The coastal brambles alliance is characterized by California blackberry, salmonberry (*Rubus spectabilis*), and thimbleberry as co-dominants in the shrub layer. This alliance has an intermittent to continuous shrub canopy less than 6 feet in height and a sparse herbaceous layer (Sawyer et al. 2009). Species associated with the alliance include California huckleberry, canyon gooseberry, coastal manroot (*Marah oregana*), coastal silk tassel (*Garrya elliptica*), cow parsnip, coyote brush, red elderberry, salal (*Gaultheria shallon*), twinberry honeysuckle (*Lonicera involucrata*), and wax myrtle. Emergent trees, such as Sitka spruce (*Picea sitchensis*), may be present at low cover (Sawyer et al. 2009).

Within the BSA, this vegetation community consists of California blackberry, red elderberry, ocean spray, deer weed, French broom, sticky monkey flower, poison oak, California mugwort (*Artemisia douglasiana*), California man-root, phacelia (*Phacelia californica),* pacific false bindweed (*Calystegia purpurata*), bedstraw (*Galium sp.*), bull thistle (*Cirsium vulgare*). This alliance primarily occurs within small patches of the Brackney North and Glen Arbor Road sections of the BSA.

4.1.2.2 Coyote Brush Scrub

The coyote brush scrub alliance is characterized by coyote brush being dominant or co-dominant in the shrub canopy with bush monkeyflower (*Diplacus aurantiacus*), California blackberry, California buckwheat (*Eriogonum fasciculatum*), California coffee berry, California sagebrush (*Artemisia californica*), deer weed (*Acmispon glaber*), poison oak, purple sage (*Salvia leucophylla*), wax myrtle, white sage (*Salvia apiana*), and yellow bush lupine (*Lupinus arboreus*). This alliance has a variable shrub canopy less than 10 feet in height with a variable ground layer (Sawyer et al. 2009). Emergent tree species associated with the alliance may occur at low cover including Bishop pine (*Pinus muricata*), Douglas fir, coast live oak, or California bay (Sawyer et al. 2009).

Within the BSA, this vegetation community consists primarily of coyote brush with pink honeysuckle, bush monkeyflower, and wedgeleaf ceanothus (*Ceanothus cuneatus*). Scattered coast live oak trees are interspersed and the understory is composed of annual grasses and forbs. This alliance occurs within the Felton Pump Station, Henry Cowell Redwoods State Park, Newell Creek Road, and San Lorenzo Way sections of the BSA.

4.1.2.3 Poison Oak Scrub

The poison oak scrub alliance is characterized by poison oak being dominant in the shrub canopy. Poison oak scrub has a two-tiered intermittent to continuous shrub canopy less than 13 feet in height with a variable herbaceous layer (Sawyer et al. 2009). Species associated with the alliance include black sage (*Salvia mellifera*), blue elderberry (*Sambucus nigra*), bush monkeyflower, California sagebrush, coyote brush, heartleaf keckiella (*Keckiella cordifolia*), hollyleaf redberry (*Rhamnus ilicifolia*), laurel sumac (*Malosma laurina*), Lewis' mock orange (*Philadelphus lewisii*), purple sage, thimbleberry, and toyon. Emergent trees may be present at low cover.

Within the BSA, this vegetation community consists of poison oak, French broom, box elder, California blackberry, coyote brush, blue elderberry, old man's beard (*Clematis vitalba*), western vervain (*Verbena lasiostachys*). This alliance occurs within the Brackney South section of the BSA.

4.1.2.4 Silverleaf (Bonny Doon) Manzanita Chaparral

The silverleaf (Bonny Doon) manzanita chaparral alliance is characterized by silverleaf manzanita (*Arctostaphylos silvicola*) as being dominant or co-dominant in the shrub canopy with bush monkeyflower, California coffee berry, California sagebrush, California yerba santa, chamise (*Adenostoma fasciculatum*), glossyleaf manzanita (*Arctostaphylos sensitiva*), golden-yarrow (*Eriophyllum confertiflorum*), mock heather (*Ericameria ericoides*), silver bush lupine (*Lupinus albifrons*), toyon, wedgeleaf ceanothus, and woollyleaf manzanita (*Arctostaphylos crustacea* ssp. *crinita*). This alliance has an intermittent to continuous shrub canopy less than 19 feet in height with a sparse herbaceous layer (Sawyer et al. 2009). Emergent tree species associated with the alliance may occur at low cover including coast live oak, Douglas fir, knobcone pine, Pacific madrone, and Ponderosa pine (Sawyer et al. 2009).

Within the BSA, this vegetation community is dominated by silverleaf manzanita, buckbrush, chamise, and yerba santa. The emergent trees frequently include ponderosa pine and coast live oak. Canopy gaps within the shrubs support bush monkeyflower and herbs such as Ben Lomond spineflower (*Chorizanthe pungens var harwegiana*), Santa Cruz monkeyflower (*Diplacus rattanii ssp. decurtatus*) and hollyleaf navarretia (*Navarretia atractyloides*) (McGraw 2021a). This alliance occurs within distinct patches of the Glen Arbor Road, Graham Hill Road North, Newell Creek Road, and Pipeline Road sections of the BSA. Within the proposed alignment there are three main occurrences: atop Mount Hermon in the Graham Hill Road North section, near the intersection of Glen Arbor and Quail Hollow Roads in the Glen Arbor section, and in the western portion of the Newell Creek Road section south of the landfill (McGraw 2021a).

4.1.3 Herbaceous Alliances and Stands

4.1.3.1 Wild Oats and Annual Brome Grasslands

The wild oats and annual brome grasslands alliance is co-dominated by several grass species, including rattlesnake grass, mouse barley (*Hordeum murinum*), purple false brome (*Brachypodium distachyon*), ripgut brome (*Bromus diandrus*), slender oat (*Avena barbata*), soft brome (*Bromus hordeaceus*), and wild oat (*Avena fatua*). The alliance has an open to continuous herbaceous canopy less than 4 feet in height (Sawyer et al. 2009). Additional species in low cover associated with this semi-natural stand includes Australian saltbush (*Atriplex semibaccata*) and other *Hordeum* species.

Within the BSA, this vegetation community consists of non-native grasses such as wild oats (*Avena sp.*), soft brome, ripgut brome. Other cover includes smooth cats ear (*Hypochaeris glabra*) and English plantain (*Plantago lanceolata*), spring vetch (*Vicia sativa*). This alliance occurs within the Graham Hill Road South, Henry Cowell Redwoods State Park, San Lorenzo Way, and Santa Cruz Lumber Yard sections of the BSA.

4.1.4 Non-Natural Land Covers

The following non-natural land covers are determined by human use instead of natural vegetation and are therefore not classified by CDFW's Natural Communities List (CDFW 2020). They have been defined for this report observations in the field.

4.1.4.1 Dirt Road

The dirt road mapping unit refers to areas that have been graded and are actively used and maintained for vehicular access. These linear routes are not paved but characterized by compacted soils that generally lack vegetation. These areas provide relatively low biological value but may serve as movement routes for some wildlife species.

This mapping unit is associated with established access roads and major trails throughout the BSA. This mapping unit included sections of old pavement pieces and gravel, and adjacent vault/utility boxes installed along the roads. Perimeter plants included California blackberry, rattlesnake grass, ribwort plantain (Plantago lanceolata), rip-gut brome, tall flatsedge (*Cyperus eragrostis*), rushes, creeping wood sorrel, broadleaf forget me-not (*Myosotis latifolia*), poison oak, sticky monkey flower, bull thistle, Epilobium sp., sword fern, pacific false bindweed, and common cotoneaster. This land cover occurs within the Brackney North, Brackney South, Graham Hill Road North, and San Lorenzo Way sections of the BSA.

4.1.4.2 Disturbed Habitat

The disturbed habitat mapping unit refers to areas where soils have been recently or repeatedly disturbed by grading, compaction, or clearing of vegetation. Structures are typically not present within disturbed habitats, and these areas provide relatively low value for most plant and wildlife species. When vegetated, disturbed habitat supports predominantly non-native plant species such as ornamentals or ruderal exotic species that take advantage of disturbance.

Within the BSA, disturbed habitat corresponded with horse pastures and an abandoned Christmas tree farm, as well as unpaved roadways and urban areas. Associated species observed in the field included star thistle, *Bromus* sp., shortpod mustard (*Hirschfeldia incana*), and other non-native grasses. This mapping unit is relatively common and occurs within the Brackney South, Felton Pump Station, Graham Hill Road North, Graham Hill Road South, Henry Cowell Redwoods State Park, Newell Creek Road, Pipeline Road, and San Lorenzo Way sections of the BSA.

4.1.4.3 Parks

The parks mapping unit refers to areas where non-native ornamental species and landscaping schemes have been installed and maintained, usually as part of commercial or residential property/park. This habitat type typically supports myriad ornamental species, including, but not limited to, Bermudagrass (*Cynodon dactylon*), hottentot fig (*Carpobrotus edulis*), Peruvian peppertree (*Schinus molle*), Brazilian peppertree (*Schinus terebinthifolius*), and red apple iceplant (*Aptenia cordifolia*).

Within the BSA, parks occur near and adjacent to developed residential areas. Within the BSA, this mapping unit consists of areas that were managed as public parks, with mowed lawns, parking lots, trails and public access. This mapping unit occurs within distinct patches of the Felton Pump Station and Graham Hill Road North sections of the BSA.

4.1.4.4 Rural Residential

The rural residential mapping unit identifies land occupied by residential structures, paving, and other impermeable surfaces in remote settings. Natural and non-natural vegetation communities are often interspersed within areas of low density. These areas may support vegetation or habitat for species.

Within the BSA, ornamental vegetation associated with the rural residential mapping unit included redwoods, madrone, coast live oak, English ivy, California bay, California blackberry, French broom, beaked hazelnut, and some walnut trees. Other areas within in this mapping unit included swales within neighborhood settings covered in English ivy, surrounded by redwoods and California bay. This land cover is the most common and occurs in all sections of the BSA except the Pipeline Road and Santa Cruz Lumber Yard sections.

4.1.4.5 Urban/Developed

The urban/developed mapping unit refers to areas that have been constructed on or otherwise physically altered to the point where vegetation is no longer present. Urban or developed areas are characterized by permanent or semi-permanent structures, hardscapes, and landscaped areas that require irrigation.

Within the BSA, this mapping unit identifies developed areas for dense residential, commercial, and industrial uses. This land cover occurs in all sections of the BSA except the Brackney North section.

4.2 Plants and Wildlife Observed

4.2.1 Plants

Dudek biologists recorded 115 species of native or naturalized plants, consisting of 88 native (77%) and 27 non-native (23%) species, in the BSA during vegetation community mapping and biological reconnaissance surveys and JMc recorded 215 plant species during focused botanical surveys of the Brackney North and Graham Hill Road North and Graham Hill Road South sections. Full lists of plant species observed are provided in Appendix D, Plant Compendium, and Appendix F. Special-status plant species that were detected or have a high potential to occur within the BSA are discussed under Section 4.3.2, Special-Status Plants.

4.2.2 Wildlife

A total of 37 wildlife species, consisting of 35 native species (95%) and 2 non-native species (5%), were recorded within the BSA during surveys. A full list of observed wildlife species by taxonomic group is provided in Appendix E, Wildlife Compendium and Appendix G. Several other common wildlife species are expected to occur within the BSA and are noted below for each group of species. Special-status wildlife species that may occur but were not observed are discussed under Section 4.3.3, Special-Status Wildlife.

4.2.2.1 Fish

The BSA provides diverse habitats that support a variety of native fish species. The San Lorenzo River and its tributaries support a diverse fish assemblage including Sacramento sucker (*Catostomus occidentalis*), California roach (*Lavinia symmetricus*), and speckled dace (*Rhinichthys osculus*), all of which are native species. Other species include black crappie (*Pomoxis nigromaculatus*), channel catfish (*Ictalurus punctatus*), common carp (*Cyprinus carpio*), resident rainbow trout (*Oncorhynchus mykiss*), threadfin shad (*Dorosoma petenense*), and white catfish (*Ameiurus catus*). Several anadromous species that are considered special-status species, such as Central California Coast steelhead (steelhead) (*O. mykiss irideus*) and Pacific lamprey (*Entosphenus tridentata*), also occur and are further described in Section 4.3.3, Special-Status Wildlife.

4.2.2.2 Birds

Thirty (30) species of birds were observed during surveys. Common woodland and forest species observed include downy woodpecker (*Dryobates pubescens*), Nuttall's woodpecker (*D. nuttallii*), California scrub-jay (*Aphelocoma californica*), Steller's jay (*Cyanocitta stelleri*), and dark-eyed junco (*Junco hyemalis*). Other common species expected to occur in the BSA, based on the presence or oak woodland and/or coniferous forest, include Hutton's vireo (*Vireo huttoni*), white-breasted nuthatch (*Sitta carolinensis*), red-breasted nuthatch (*Sitta canadensis*), pygmy nuthatch (*Sitta pygmaea*), orange-crowned warbler (*Oreothlypis celata*), and brown creeper (*Certhia americana*). Common tree-nesting raptors in the region in addition to those observed include Cooper's hawk (*Accipiter cooperi*) and great horned owl (*Bubo virginianus*). Stands of emergent wetland vegetation in and adjacent to streams and wetlands provide nesting habitat for marsh wren (*Cistothorus palustris*), song sparrow (*Melospiza melodia*), and red-winged blackbird (*Agelaius phoeniceus*).

Terrestrial songbird species that breed in riparian vegetation have received increased conservation attention in recent decades due to the limited distribution and decline of riparian plant communities. Song sparrow and spotted towhee are two riparian-breeding songbirds that were observed during surveys. Additional riparian species expected to nest in the BSA include Pacific-slope flycatcher (*Empidonax difficilis*), warbling vireo (*Vireo gilvus*), black-headed grosbeak (*Pheucticus melanocephalus*), Wilson's warbler (*Cardellina pusilla*), and common yellowthroat (*Geothlypis trichas*).

4.2.2.3 Reptiles and Amphibians

Sierran treefrog (*Pseudacris sierra*) was the only amphibian species detected during surveys. Other common amphibians expected to occur in both developed and natural land cover types include arboreal salamander (*Aneides lugubris*), and California slender salamander (*Batrachoseps attenuatus*). Amphibians that would only occur in natural communities (e.g., riparian and coastal oak woodland, coastal scrub, chaparral, grassland) and occasionally in adjacent rural residential lots include California newt (*Taricha torosa*), California giant salamander (*Dicamptodon ensatus*), ensatina (*Ensatina eschscholtzii*), and western toad (*Bufo boreas*).

No reptiles were detected during surveys but several common species are expected to occur. Western fence lizard (*Sceloporus occidentalis*) and common garter snake (*Thamnophis sirtalis*) are common species in both developed and natural land cover types as long as hard surfaces for basking (e.g., fence posts, rocks, logs, sides of buildings) are present for the former and water is nearby for the latter. Other species have narrower habitat requirements and only occur in natural land cover, occasionally venturing onto rural residential lots within or adjacent to natural land cover. Species in this category include southern alligator lizard (*Elgaria multicarinata*), northern rubber boa (*Charina bottae*), California kingsnake (*Lampropeltis californiae*), gopher snake (*Pituophis catenifer*), striped racer (*Coluber lateralis*), forest sharp-tailed snake (*Contia longicauda*), ring-necked snake (*Diadophis punctatus*), and western rattlesnake (*Crotalus oreganus*).

4.2.2.4 Mammals

Five mammals, three native and two non-native, were detected during surveys. The three native species, western gray squirrel (*Sciurus griseus*), mule deer (*Odocoileus hemionus*), and dusky-footed woodrat (*Neotoma fuscipes*), are common residents of woodland and forest habitats throughout the Central Coast Range.

Other common mammals likely to inhabit the BSA include fox squirrel (*Sciurus niger*), striped skunk (*Mephitis mephitis*), brush rabbit (*Sylvilagus bachmani*), Botta's pocket gopher (*Thomomys bottae*), Virginia opossum (*Didelphis virginiana*), and raccoon (*Procyon lotor*).

4.2.2.5 Invertebrates

The total number and diversity of arthropods, including crustaceans, insects, centipedes, millipedes, and arachnids and gastropods (snails and slugs) in the BSA is unknown and impossible to estimate because many groups of arthropods and gastropods have not been studied. The following summary focuses on a few well-known species and a very broad overview of taxonomic groups. The banana slug (*Ariolimax* spp.), a common mollusk of moist forest floors, is perhaps the most well-known invertebrate to the public. Common butterflies include western tiger swallowtail (*Papilo rutulus*), cabbage white (*Pieris rapae*), acmon blue (*Plebejus acmon*), gulf fritillary (*Agraulis vanillae*), and California tortoiseshell (*Nymphalis californica*), among many others. Native aquatic invertebrate species richness is high or moderately high and includes five groups (orders) of insects that reproduce in water and transform into flying insects as adults; these include caddisflies (Trichopetera), mayflies (Ephemeroptera), stoneflies (Plecoptera), dobsonflies (Neuroptera), and dragonflies (Odonata). True flies (Diptera), true bugs (Hemiptera), and beetles (Coleoptera) are very common in terrestrial habitats but are also important components of many aquatic communities. Mount Hermon June beetle is a federally threatened species endemic to the Sandhills of central Santa Cruz County and is discussed further in Section 4.3.3.1. Grasshoppers, crickets, and katydids (Orthoptera) primarily occur in terrestrial habitats.

4.3 Special-Status Biological Resources

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

4.3.1 Sensitive Vegetation Communities

Sensitive vegetation communities include the following: (1) those designated as sensitive by CDFW (2020) (CDFW sensitive natural communities), which includes riparian vegetation communities; and (2) those designated as sensitive habitats by the County of Santa Cruz within Chapter 5 of the General Plan and County Code Title 16, some of which overlap with the CDFW designations. Each of these are briefly discussed below.

4.3.1.1 CDFW Sensitive Natural Communities

CDFW sensitive natural communities are 'natural communities' (of vegetation) or 'vegetation types' that have been evaluated by CDFW using NatureServe's Heritage Methodology (Master et. al. 2012) and vegetation community classifications from *A Manual of California Vegetation* (MCV; Sawyer et. al. 2009), and ranked as imperiled or vulnerable. Evaluation is done at both the global (i.e., full natural range within and outside of California), and State (i.e., within California) levels resulting in a single 'G' (global) and 'S' (state) rank ranging from 1 (i.e., very rare and threatened) to 5 (i.e., demonstrably secure). The five levels of S-ranks are defined as follows:

- **S1 = Critically Imperiled**. Critically imperiled in California because of extreme rarity (often 5 or fewer populations) or because of factor(s) such as very steep declines making it especially vulnerable to extirpation.
- **S2 = Imperiled**. Imperiled in California because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation.
- **S3 = Vulnerable.** Vulnerable in California due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- **S4 = Apparently Secure.** Uncommon but not rare in California; some cause for long-term concern due to declines or other factors.
- **S5 = Secure.** Common, widespread, and abundant in the state.

Natural communities with an S rank of S1, S2, or S3 are considered "sensitive" by CDFW and typically addressed in the CEQA environmental review process.

Dudek biologists reviewed the MCV for sensitive vegetation communities (alliances) in the Central California Coast ecoregion that have the potential to occur within the BSA. A total of 13 sensitive natural communities were identified as occurring within the BSA. Table 4 summarizes the sensitive natural communities (alliances) that were identified as occurring in the BSA based on the field mapping conducted for the project.

Table 4. Sensitive Vegetation Communities within the Biological Study Area

Vegetation Alliance (Common Name)	CDFW CA Code	State Rarity	BSA (acres)
Forest and Woodland Alliances and Stands			
Bigleaf maple forest and woodland*	61.450.00	S3	2.7
Black cottonwood forest and woodland*	61.120.00	S3	1.8
Box-elder forest and woodland*	61.440.00	S2	2.4
California bay forest and woodland*	74.100.00	S3	20.9
California sycamore woodland*	61.310.00	S3	12.0
Douglas fir - tanoak forest and woodland	82.500.00	S3	4.5
Redwood forest and woodland	86.100.00	S3	186.4
Shrubland Alliances and Stands			
Coastal brambles	63.901.00	S3	0.4
Silverleaf manzanita chaparral	37.320.00	S1	44.0
Total			**275.1**

Note:
* indicates riparian vegetation community
State Rarity: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable (CDFW 2020)

Riparian

Riparian vegetation communities occur along streams, ponds, rivers, and lakes and are considered sensitive because of their high habitat value for native wildlife. Riparian vegetation communities within the BSA included those mapped as bigleaf maple forest and woodland, black cottonwood forest and woodland, box-elder forest and woodland, California bay forest and woodland, California sycamore forest and woodland, and white alder groves. However, smaller, unmapped stands may also occur wherever water is available.

4.3.1.2 County of Santa Cruz Sensitive Habitats

Two additional sensitive habitat types as mapped by Santa Cruz County and protected under County Code 16.32 occur within the BSA: Special Forests and Sandhills Habitat. Both habitat types were defined in the County General Plan adopted May 24, 1994. Special Forests and Sandhills Habitat within the BSA are depicted in Figures 4a and 4b for the northern and southern segments, respectively.

Special Forests

Special Forests are forests that are (1) unique natural communities, (2) limited in supply and distribution, (3) threatened by substantial disturbance from human activities, and (4) habitat for rare, endangered and/or locally unique species of plants and animals. Examples of Special Forests include San Andreas oak woodlands, woodland/maritime chaparral, indigenous Ponderosa pine, and indigenous Monterey pine forests. Within the BSA, the County has identified Special Forest within the Glen Arbor Road section and forest lands within Henry Cowell Redwoods State Park that traverses Graham Hill Road. Approximately 2.7 acres of the Glen Arbor Road section and 82.5 acres of the Graham Hill Road North section have been mapped as Special Forest.

Sandhills Habitat

The Santa Cruz Sandhills is a unique habitat type that only occurs on outcrops of the Zayante snds soil type in central Santa Cruz County and is known to support several special-status plant and wildlife species. Sandhills habitat occurs in the Scotts Valley, San Lorenzo Valley, and Bonny Doon areas. In these locations, Zayante sands soils provide habitat for several special-status species endemic to (i.e., found only in) this area, such as the Mount Hermon June beetle, the Zayante band-winged grasshopper, the Santa Cruz kangaroo rat (*D. venestus*), Scotts Valley spineflower, Santa Cruz wallflower, and silver-leaved manzanita. Like the Special Forest designation, the County maintains a map of Sandhills Habitat. This dataset was reviewed and refined as appropriate during the Sandhills habitat assessment. Results of the habitat assessment revealed that approximately 416 acres of Sandhills habitat occurs within the proposed Newell Creek Road, Glen Arbor Road, and Graham Hill Road North sections, as well as a small portion of the Graham Hill Road South section, and the existing Pipeline Road sections of the BSA.

4.3.2 Special-Status Plants

As discussed in Section 3, special-status plants include those listed, or candidates for listing, as threatened or endangered by the USFWS and CDFW, and species identified as rare by the CNPS (particularly CRPR 1A – presumed extinct in California; CRPR 1B – rare, threatened, or endangered throughout its range; and CRPR 2 – rare or endangered in California, more common elsewhere). Special-status plant species directly observed during surveys conducted from April through July 2021 (McGraw 2021b) or known to occur in the surrounding region are described in Appendix F, Special-Status Plant Species Potential to Occur within the Biological Study Area. Appendix F describes their known occurrences or potential to occur within the BSA based on their general biology (e.g., primary habitat associations, life form, blooming period, and known elevation range). Figure 5 illustrates the historical locations for special-status plant species. There is no USFWS-designated critical habitat for listed plant species within the BSA (USFWS 2020). Figure 6 illustrates the results of current focused special-status plant species surveys conducted in 2021 (McGraw 2021b).

Based on the results of the literature review and database searches (CDFW 2021a, CDFW 2021c, CNPS 2021, USFWS 2021), Dudek identified 59 special-status plant species as potentially occurring in the region surrounding the BSA. Of these, 31 species are not expected to occur due to the absence of suitable habitat or because the BSA

is outside the known range of the species; and 12 species are considered to have low potential to occur based on the presence of low-quality habitat. These species were not analyzed further, thereby refining the analysis to the remaining 16 species with potential to occur in the area.

A total of seven species were determined to have a moderate potential to occur in the BSA based on the soils, vegetation communities (habitat) present, elevation range, and previous known locations based on the CNDDB, IPaC, and CNPS Inventory: Anderson's manzanita (*Arctostaphylos andersonii*), deceiving sedge (*Carex saliniformis*), Kellogg's horkelia (*Horkelia cuneata* var. *sericea*), Point Reyes horkelia (*Horkelia marinensis*), robust spineflower (*Chorizanthe robusta* var. *robusta*), Santa Cruz wallflower, and tear drop moss (*Dacryophyllum falcifolium*). The remaining nine species were either observed or determined to have a high potential to occur in the BSA. These species are summarized in Table 5 and discussed below.

Results of the focused botanical surveys conducted in 2021 along three of the pipeline sections proposed for the first phase of project implementation (Brackney North, Graham Hill Road North, and Graham Hill Road South) documented the occurrence of three special-status plants: Ben Lomond spineflower, silverleaf (Bonny Doon) manzanita, and Ben Lomond buckwheat (McGraw 2021b). Ben Lomond spineflower and silverleaf (Bonny Doon) manzanita were detected along a 4,094-foot-long portion of the Graham Hill Road North alignment that traverses Sandhills (Figure 6). Ben Lomond spineflower occupies 10 patches totaling 294 square feet (sf), which contain a total of 1,320 individuals. Silverleaf (Bonny Doon) manzanita was mapped in 32 patches totaling 13,360 sf, which featured 125 individuals: 113 adults, 10 juveniles, and 2 seedlings. Ben Lomond buckwheat was observed outside of the proposed work area but within the BSA near the northern end of the Graham Hill Road North section.

Table 5. Special-Status Plant Species Observed or with a High Potential to Occur within the Biological Study Area

Scientific Name	Common Name	Federal/State/CRPR	Potential to Occur*
Arctostaphylos silvicola	Silverleaf (Bonny Doon) manzanita	None/None/1B.2	Observed
Chorizanthe pungens var. hartwegiana	Ben Lomond spineflower	FE/None/1B.1	Observed
Eriogonum nudum var. decurrens	Ben Lomond buckwheat	None/None/1B.1	Observed
Fissidens pauperculus	minute pocket moss	None/None/1B.1	High
Holocarpha macradenia	Santa Cruz tarplant	FT/SE/1B.1	High
Monardella sinuate ssp. nigrescens	northern curly-leaved monardella	None/None/1B.2	High
Monolopia gracilens	woodland woolythreads	None/None/1B.2	High
Plagiobothrys chorisianus var. chorisianus	Choris' popcornflower	None/None/1B.2	High
Plagiobothrys diffuses	San Francisco popcornflower	None/SE/1B.1	High

Source: CDFW 2021a; CNPS 2021.
Status Legend
***** Although the BSA provides potential habitat, the proposed work areas do not generally support suitable habitat for these species due to the disturbed and developed nature of the ROW.
Federal
FE: Federally listed as endangered
FT: Federally listed as threatened
State

SE: State listed as endangered
CRPR (California Rare Plant Rank)
List 1B: Plants rare, threatened, or endangered in California and elsewhere
Threat Rank:
.1 Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 Fairly endangered in California (20% to 80% of occurrences threatened)

4.3.2.1 Silverleaf (Bonny Doon) manzanita

Silverleaf (Bonny Doon) manzanita (*Arctostaphylos silvicola*) is a shrub with a CRPR of 1B.2 that occurs in closed-cone coniferous forest, chaparral, lower montane coniferous forest, and inland marine sands/perennial evergreen shrub (CNPS 2021; CDFW 2021a). Suitable forest and shrub habitat are present within the BSA. As noted above, this species was observed along the ROW during the 2021 habitat assessment and focused botanical surveys. The closest CNDDB occurrence was previously documented within chaparral/sandhill habitat approximately 0.06 mile southwest of the BSA in 2014 (CDFW 2020; No. 1). As noted above, this species was observed along the ROW during the 2021 habitat assessment and focused botanical surveys.

4.3.2.2 Ben Lomond spineflower

Ben Lomond spineflower is an annual herb that is federally endangered with a CRPR of 1B.1. It occurs in lower montane coniferous forest (maritime ponderosa pine Sandhills) (CNPS 2021; CDFW 2021a). Suitable forest habitat and sandhill soils are present within all portions of the BSA, except for the Graham Hill Road South section. As noted above, this species was observed along the ROW during the 2021 habitat assessment and focused botanical surveys. The closest CNDDB occurrence was previously documented approximately 20 feet southwest of the BSA in 1988 (CDFW 2020; No. 3). Ben Lomond spineflower occupies 10 patches totaling 294 square feet (sf), which contain a total of 1,320 individuals. This species also has a high potential of occurrence in the Newell Creek Road section (McGraw 2021a).

4.3.2.3 Ben Lomond buckwheat

Ben Lomond buckwheat (*Eriogonum nudum var. decurrens)* is a perennial herb with a CRPR of 1B.1 that blooms from June to October (CNPS 2021). This species occurs on sandy soils within chaparral, cismontane woodland, and lower montane woodland coniferous forest (maritime ponderosa pine Sandhills). As noted above, this species was observed in the Graham Hill Road North section of the BSA, but outside of the project work area. Suitable Sandhills habitat is present within the Newell Creek Road, Glen Arbor Road, Graham Hill Road North, Graham Hill Road South, and Pipeline Road sections of the BSA. The closest CNDDB occurrence was documented within 0.1 mile in 2017 (CDFW 2021; No. 1).

4.11.1.4 Minute pocket moss

Minute pocket moss (*Fissidens pauperculus*) is a bryophyte (moss) with a CRPR of 1B.2. This species occurs in north coast coniferous forests. The BSA supports suitable habitat for this species in all of the pipe sections due to the prevalence of coniferous forest and riparian habitat. The CNDDB lists two occurrences within Santa Cruz County (CDFW 2021). The closest CNDDB occurrence was documented approximately two miles south of the Felton Diversion in 2001 (CDFW 2021; No.11).

4.11.1.5 Santa Cruz tarplant

Santa Cruz tarplant (*Holocarpha macradenia*) is and annual herb is an annual herb that is listed as federally threatened, state endangered with the CRPR of 1B.1. It occurs in coastal prairie, coastal scrub, valley and foothill grassland habitats. The CNDDB lists 14 occurrences documented in the vicinity of Santa Cruz and Aptos (CDFW 2021). The BSA supports grasslands within the San Lorenzo Way and Graham Hill Road South sections, as well as in Henry Cowell Redwoods State Park and the San Lorenzo Lumber Yard section of the existing NCP that may provide suitable habitat for this species.

4.11.1.6 Northern curly-leaved monardella

Northern curly-leaved monardella (*Monardella sinuata* ssp. *nigrescens*) is an annual herb with the CRPR of 1B.2. It occurs in sandy soils in coastal dune, coastal scrub, and lower montane coniferous forest habitats. Marginally suitable to suitable scrub, woodland, grassland, and/or Ponderosa pine sandhill habitat is present within the BSA, including San Lorenzo Way, Graham Hill Road North, Graham Hill Road South, as well as in Henry Cowell Redwoods State Park and the San Lorenzo Lumber Yard section of the existing NCP. The closest CNDDB occurrence was documented immediately to the northeast of the BSA in 1993 (CDFW 2021; No. 11).

4.11.1.7 Woodland woolythreads

Woodland woolythreads (*Monolopia gracilens*) is an annual herb with the CRPR of 1B.1. It occurs on serpentine soils in openings within broadleafed upland forests, chapparal, cismontane woodland, north coast coniferous forests and foothill grassland. The BSA supports suitable forest and grassland habitat for this species within the Newell Creek Road, Glen Arbor Way, San Lorenzo Way The CNDDB lists 31 occurrences throughout Santa Cruz County (CDFW 2021).

4.11.1.8 Choris' popcornflower

Choris' popcornflower (*Plagiobothrys chorisianus* var. *chorisianus*) is an annual herb with the CRPR of 1B.1. It occurs in mesic conditions within chaparral, coastal prairie, and coastal scrub. The BSA supports suitable chaparral habitat for this species within the Newell Creek road, Glen Arbor Road, and Graham Hill Road North sections. the CNDDB lists 19 occurrences, modern and historic, within the vicinity of Santa Cruz (CDFW 2021).

4.11.1.9 San Francisco popcornflower

San Francisco popcornflower (*Plagiobothrys diffusus*) is an annual herb that is state endangered with a CRPR of 1B.1. It occurs in coastal prairie and valley and foothill grasslands. The BSA supports grassland within the San Lorenzo Way and Graham Hill Road South sections, as well as in Henry Cowell Redwoods State Park and the San Lorenzo Lumber Yard section of the existing NCP that may provide suitable habitat for this species. The CNDDB lists 19 occurrences, modern and historic, within the vicinity of Santa Cruz (CDFW 2021).

4.3.3 Special-Status Wildlife

As discussed in Section 3, special-status wildlife are fish or wildlife species listed, or candidates for listing, as threatened or endangered by the USFWS and CDFW, designated as SSC by CDFW, designated as fully protected under the California Fish and Game Code, or that meet the definition of rare, threatened, or endangered as

described in the CEQA Guidelines. Appendix G, Special-Status Wildlife Species Potential to Occur within the Biological Study Area, describes the special-status wildlife species that have been observed; have low, moderate, or high potential to occur; or are not expected to occur. The potential to occur is based on documented occurrences in the region, life history and general habitat requirements, and overall suitability of the habitat within the Project area to support such species. Figure 5 illustrates the historical locations for special-status wildlife species and USFWS-designated critical habitat for federally listed wildlife species. USFWS-designated critical habitat for three listed wildlife species overlaps within the BSA: marbled murrelet, steelhead, and Zayante band-winged grasshopper (USFWS 2020).

Based on the results of the literature review and database searches (CDFW 2021b, CDFW 2021c, USFWS 2021), Dudek identified 41 special-status wildlife species as potentially occurring in the region surrounding the BSA. Of these, 21 species are not expected to occur due to the absence of suitable habitat or because the BSA is outside the known range of the species; and 7 species are considered to have low potential to occur based on the presence of low-quality habitat. These species were not analyzed further, thereby refining the analysis to the remaining 13 species with potential to occur in the area.

A total of six species were determined to have a moderate potential to occur in the BSA based on known occurrences and/or the presence of suitable habitat: pallid bat (*Antrozous pallidus*), steelhead, Townsend's big-eared bat (*Corynorhinus townsendii*), western pond turtle (*Emys* [=*Actinemys*] *marmorata*), western red bat (*Lasiurus blossevillii*), and Zayante band-winged grasshopper. The remaining seven species were determined to have a high potential to occur in the BSA. These species are summarized in Table 6 and discussed below. Species accounts for special-status wildlife that occur in the Sandhills habitat (Mount Hermon June beetle and Santa Cruz kangaroo rat) were adapted from McGraw (2021a). Secondary references (i.e., cited in McGraw [2021a] but not referenced by Dudek) have been excluded from this report for brevity but are available on request.

4.3.3.1 Invertebrates

Mount Hermon June Beetle

Mount Hermon June beetle is a member of the family Scarabaeidae (Insecta: Coleoptera) that occurs primarily on Zayante sand soil in central Santa Cruz County; the species has also been observed on sandy loam and loamy sand soils adjacent to Zayante soils (USFWS et al. 2011). Mount Hermon June beetle occurs in all Sandhills habitat of varying successional stages, including ponderosa pine forest, silverleaf manzanita chaparral and other chaparral, and coast live oak woodlands, as well as other woodlands and forests, and sand parkland (McGraw and Jordan 2021). It has also been observed in areas where native Sandhills habitat plant species have been removed, including those that are disturbed through development and that feature primarily ornamental or other non-native plant species (Arnold 2004).

Mount Hermon June beetle has high potential to occur in the BSA. There are two CNDDB occurrences that overlap the BSA along the Graham Hill Road North and Graham Hill Road South alignments (CDFW 2021c). Additionally, highly suitable Sandhills habitat occurs within the Newell Creek Road, Glen Arbor Road, and Pipeline Road sections of the BSA. Overall, Mount Hermon June beetle is likely to occur in portions of the BSA that support Zayante sand soil, including areas of transitional soils, and adjacent sandy loam soils. Within these soil types, the species can occur in all plant communities and other land cover types, including developed and disturbed areas, as well as paved areas.

Table 6. Special-Status Wildlife Species with a High Potential to Occur within the Biological Study Area

Scientific Name	Common Name	Federal/State	Potential to Occur*
Invertebrates			
Polyphylla barbata	Mount Hermon June beetle	FE/None	High
Amphibians			
Aneides flavipunctatus niger	Santa Cruz black salamander	None/SSC	High
Dicamptodon ensatus	California giant salamander	None/SSC	High
Birds			
Contopus cooperi	olive-sided flycatcher	None/SSC	High
Elanus leucurus	white-tailed kite	None/FP	High
Mammals			
Dipodomys venustus	Santa Cruz kangaroo rat	None/SS (S1)	High
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	None/SSC	High

Source: CDFW 2021b.
Status Legend
***** Although the BSA provides potential habitat, the proposed work areas do not generally support suitable habitat for these species due to the disturbed and developed nature of the ROW.
Federal
FE: federally endangered
State
SSC: California species of special concern
FP: fully protected species
SS: Listed Special Animals List
(S1): Critically Imperiled. At very high risk of extirpation in the state due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.

4.3.3.2 Amphibians

Santa Cruz Black Salamander

The Santa Cruz black salamander (*Aneides flavipunctatus niger*) is restricted to mesic deciduous or coniferous forests in the fog belt of the outer Coast Range of San Mateo, Santa Cruz, and Santa Clara counties. It occurs in moist streamside microhabitats and is typically found under rocks near streams, in talus, and under damp woody debris.

Santa Cruz black salamander has high potential to occur in the BSA. Streams (e.g., Newell Creek and Zayante Creek), and adjacent drainages provide suitable habitat and there are documented historical occurrences of this species in the vicinity of Ben Lomond southwest of the BSA (from the 1930s and 1960s) and a more recent record (from 2012) from Henry Cowell Redwoods State Park farther south (CDFW 2021c).

California Giant Salamander

The California giant salamander occurs in wet coastal forests near streams and seeps. This species' range is limited to Mendocino County, south to Monterey County and east to Napa County. Aquatic larvae are found in cold, clear streams and occasionally occur in lakes and ponds. Adults occur in wet forests under rocks and woody debris in the vicinity of streams or lakes.

California giant salamander has high potential to occur in the BSA. Streams, drainages, and seeps in nearby uplands provide suitable habitat and Dudek observed four larvae near the existing Newell Creek Dam outlet in September 2018 during surveys for the Newell Creek Dam Inlet/Outlet Improvement Project (Dudek 2018). There are also two historic CNDDB occurrences in the vicinity: a 1930 museum specimen collected 0.25 mile west of the Newell Creek Road section (Occ. No. 132) and a 1972 observation in a roadside culvert 0.4 mile west of the Pipeline Road section (Occ. 137) (CNDDB 2021c).

4.3.3.3 Birds

Olive-sided Flycatcher

Olive-sided flycatcher (*Contopus cooperi*) is a summer resident and migrant in California from mid-April to October; the breeding season extends from early May to late August. It occurs in coniferous forests with open canopies from near sea level to 9,400 feet throughout the state, where it is mostly associated with edges, openings, and natural and human-created clearings in otherwise dense forest. Open-cup nests are placed on the upper surface of a tree branch, typically 30 to 50 feet aboveground (Shuford and Gardali 2008).

This species has high potential to occur in the BSA from May to August. There are several eBird (2021) observations in the BSA vicinity during this period and suitable habitat is present in most forest vegetation communities throughout the BSA. There are no CNDDB occurrences within or near the BSA but this species is poorly represented in the CNDDB because of its non-listed status and relatively recent addition to CDFW's SSC list.

White-tailed Kite

White-tailed kite (*Elanus leucurus*) is a fully protected raptor species that occurs throughout California, primarily west of the Sierra Nevada in lowlands and foothills. Although white-tailed kites typically occur in open habitats such as grassland, marsh, and savanna, they will also use marginal habitats such as freeway edges and medians when foraging for voles and mice. Nests are constructed in a variety of trees, with coast live oak perhaps the most common, and placed high in the crown on thin branches (Peeters and Peeters 2005).

White-tailed kite has high potential to nest but low potential to forage in the BSA. The forest and woodland vegetation communities provide suitable nest trees but the extent of open grassland or meadows for foraging is limited. The nearest CNDDB occurrence is a 2004 nest on the University of California, Santa Cruz (UCSC) Reserve approximately 1.5 miles west of the Graham Hill Road section (Occ. No. 83) (CDFW 2021c).

4.3.3.4 Mammals

Santa Cruz Kangaroo Rat

Santa Cruz kangaroo rat is a subspecies of narrow-faced woodrat endemic to the Santa Cruz Mountains. It is currently only known to inhabit two areas: Mount Hermon atop Graham Hill Road in central Santa Cruz County and chaparral within the Sierra Azul Open Space Preserve in the Summit Area of the Santa Cruz Mountains. Within the Sandhills habitat, Santa Cruz kangaroo rat is known primarily from silverleaf manzanita chaparral, though the species may also occur in adjacent areas of ponderosa pine forest that feature a significant shrub component.

Santa Cruz kangaroo rat has high potential to occur in the BSA. The Graham Hill Road North section overlaps the known Mount Hermon occurrence, where it has been trapped within Henry Cowell Redwoods State Park on the

south side of the road and in the County of Santa Cruz Juvenile Hall Parcel on the north side of the Road (Bean 2004, McGraw 2021a). The Newell Creek Road and Glen Arbor Road sections of the BSA also feature silverleaf manzanita chaparral habitat that is highly suitable for the species. Patches of Sandhills chaparral traversed by the Pipeline Road section have moderate suitability for the species. Individual Santa Cruz kangaroo rats could disperse through the Proposed Project, including the road and road ROW; habitat adjacent to the road may also support suitable burrows for this species.

San Francisco Dusky-footed Woodrat

The San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*) is a subspecies of dusky-footed woodrat that occurs in forest habitats with moderate canopy and dense to moderate understories, particularly on the upper banks of riparian forests or within poison oak-dominated shrublands (CDFW 2021c). The San Francisco dusky-footed woodrat is a small-sized rodent that builds middens made of sticks, typically at the base of trees and shrubs, but sometimes in the low to mid-level canopy of a tree. The dusky-footed woodrat feeds on a variety of woody plants, fungi, flowers and seeds. This species requires ample midden building materials to construct middens of shredded grass, leaves, or other materials. This species in known to occur along Smith Grade and was observed in 2006 near the intersection with Bonny Doon Road where multiple middens were observed primarily located in redwood forest and coyote brush scrub habitat (CDFW 2021c). Woodrat middens were observed within the Brackney South, Felton Pump Station and San Lorenzo Way sections of BSA during January 2021 field surveys.

4.3.3.5 Listed Species with Low or Moderate Potential to Occur

The federally endangered Zayante band-winged grasshopper is known to occur in the Sandhills habitat but has moderate potential to occur in the BSA. Areas along the Newell Creek Road and Graham Hill Road North sections feature open areas of silverleaf manzanita chaparral that are moderately suitable, the Glen Arbor Road section supports low-quality habitat, and the species is not expected to occur along the Graham Hill Road South section. The small patch of Sandhills habitat along Pipeline Road has low suitability for the species. Zayante band-winged grasshopper has limited potential to occur in road turn outs on Zayante soil adjacent to suitable habitat in the proposed work area; these areas feature loose sand soil and open canopies as well as sparse, primarily herbaceous vegetation that are suitable for this species.

Two listed anadromous fish species, coho salmon (*Oncorhynchus kisutch*) (Central California Coast Evolutionarily Significant Unit [ESU]) and steelhead (Central California Coast Distinct Population Segment [DPS]) are known to occur in the San Lorenzo River watershed but have low or moderate potential to occur in the BSA. Coho salmon is federally and state-listed as endangered and steelhead is federally listed as threatened. Suitable coho salmon spawning and rearing habitat is present in the San Lorenzo River and its tributaries but very few coho have been observed in the watershed since the late 1980s and the species is likely absent from Newell Creek due to a natural bedrock shelf approximately 0.7 mile downstream of Newell Creek Dam that acts as a barrier to anadromous fish passage (NMFS 2012, HES 2017). Coho salmon therefore has low potential to occur in the BSA. The same bedrock feature that blocks coho salmon access to upper Newell Creek is also considered to limit steelhead access except during abnormally high flows; spawning and rearing habitat quality is considered poor in this reach, as well (HES 2017). Steelhead are known to occur in the lower reaches of Newell Creek and other creeks within the BSA (e.g., Fall, Bean, and Zayante Creeks) and considered to have a moderate potential to occur in the BSA.

The federally threatened California red-legged frog (*Rana draytonii*) is known to occur in the region (Santa Cruz Mountains) but has low potential to occur in the BSA. Newell Creek and other streams in the BSA are suitable for foraging and movement but the lack of deep plunge pools or other areas of still or slow-moving water and the

presence of non-native predatory fish preclude breeding (Dudek 2018). Most aquatic features in the BSA are narrow, steep ephemeral drainages that do not pond water or support emergent vegetation. There are several CNDDB occurrences within 1 to 4 miles of the BSA, with the closest approximately 1 mile west of the Santa Cruz Lumber Yard section in Bull Creek, where an adult was seen in 2004 (Occ. No. 854) (CDFW 2021c). Protocol-level (USFWS 2005) surveys for this species along Newell Creek and other City watershed lands in 2001 did not detect any red-legged frogs (City of Santa Cruz Water Department 2013) and a follow-up survey for the proposed hydroelectric project at Newell Creek Dam in 2013 also had negative results (Biotic Resources Group 2013).

The federally and state-endangered marbled murrelet (*Brachyramphus marmoratus*) is known to occur in the region but has very low potential to occur in the BSA at Henry Cowell Redwoods State Park. Most forest in this area is second-growth, having been extensively logged since the late 19th century (although timber harvesting on City-owned lands ceased about 20 years ago), and is therefore unsuitable for nesting murrelets. The closest CNDDB occurrence is a 2001 observation of "[two] birds circling below the [forest] canopy" in the Fall Creek sub-watershed of Henry Cowell Redwoods State Park, approximately 2 miles west of the Glen Arbor Road section (Occ. No. 3) (CDFW 2021c). This area also represents the southernmost marbled murrelet breeding location in the Santa Cruz Mountains and the "only occupied murrelet site in the San Lorenzo River watershed" (Singer 2017). Dudek biologists also observed a single murrelet flying approximately 0.2 miles northwest of the Newell Creek Road section of the BSA during surveys for the Newell Creek Dam project in 2018 (Dudek 2018), presumably toward higher-quality habitat to the northwest.

4.3.4 Potential Jurisdictional Aquatic Resources

Potentially jurisdictional aquatic resources, including federal and state jurisdictional wetlands and non-wetland waters, occur throughout the BSA. Federal and state jurisdictional aquatic resources are regulated under the CWA, CFGC, Porter-Cologne Water Quality Act, and the California Coastal Act (see Section 2, Regulatory Setting, for additional information about the related laws and regulations). For the purposes of this assessment, the following riparian vegetation communities potentially support jurisdictional wetlands and waters under federal and state regulations:

- Black cottonwood forest and woodland
- Bigleaf maple forest and woodland
- Box-elder forest and woodland
- California bay forest and woodland
- California sycamore woodland
- White alder groves

Refer to the vegetation community descriptions in the Section 4.1 above for the occurrence and description of riparian habitat within the BSA. Due to the homogenous canopy where streams flow through certain forested areas that are not typically considered riparian vegetation, such as redwoods and coast live oak, a riparian buffer was applied to streams and creeks to capture the riparian corridor. The Santa Cruz County riparian corridor buffer of 50 feet off the OHWM was applied to the perennial and intermittent streams within the BSA to encompass the riparian

corridor in the forested areas that were not comprised of typical riparian vegetation. It should be noted that unmapped stands of potentially jurisdictional riparian vegetation may also occur wherever water is available.

Potentially jurisdictional aquatic resources identified in the field included perennial and intermittent streams, ephemeral drainages, and wetlands. There were approximately 86 non-wetland waters and 1 wetland identified within the BSA. The majority of the non-wetland waters are ephemeral drainages and include ditches, culverts, and swales. There are six major, named streams and creeks within the BSA: San Lorenzo River, Newell Creek, Zayante Creek, Bean Creek, Powder Mill Creek, and Camp Evers Creek. Other unnamed, intermittent drainages also occur within the BSA based on mapping compiled by the County within the Streams dataset (Santa Cruz County 2020). All of the named creeks within the BSA are tributaries to the San Lorenzo River. The San Lorenzo River is a perennial drainage that originates in the Santa Cruz mountains, flows through the City of Santa Cruz, and ultimately drains into the Pacific Ocean. Figure 4 illustrates the location and extent of potentially jurisdictional aquatic resources within the BSA.

4.3.5 Wildlife Corridors/Habitat Linkages

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Wildlife corridors contribute to population viability by assuring continual exchange of genes between populations, providing access to adjacent habitat areas for foraging and mating, and providing routes for recolonization of habitat after local extirpation or ecological catastrophes (e.g., fires).

Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation. Habitat linkages provide a potential route for gene flow and long-term dispersal of plants and animals and may also serve as primary habitat for smaller animals, such as reptiles and amphibians. Habitat linkages may be continuous habitat or discrete habitat islands that function as steppingstones for dispersal.

The BSA has value as a potential habitat linkage between areas of adjacent forest habitats. Regionally significant drainages such as Newell Creek , Zayante Creek, and San Lorenzo River flow through and along the BSA. These creek corridors are likely used by common and special-status wildlife species as cover and foraging habitat and to move between adjacent similar habitats. However, the BSA does not overlap with any large landscape blocks (Penrod 2014b) or critical linkages (Penrod 2014a) mapped by Penrod et al. (2013).

5 References

14 CCR 15000–15387 and Appendices A–L. Guidelines for Implementation of the California Environmental Quality Act, as amended.

16 USC 1531–1544. Endangered Species Act of 1973, as amended.

33 USC 1251–1387. Water Pollution Control Act Amendments of 1972 (Clean Water Act).

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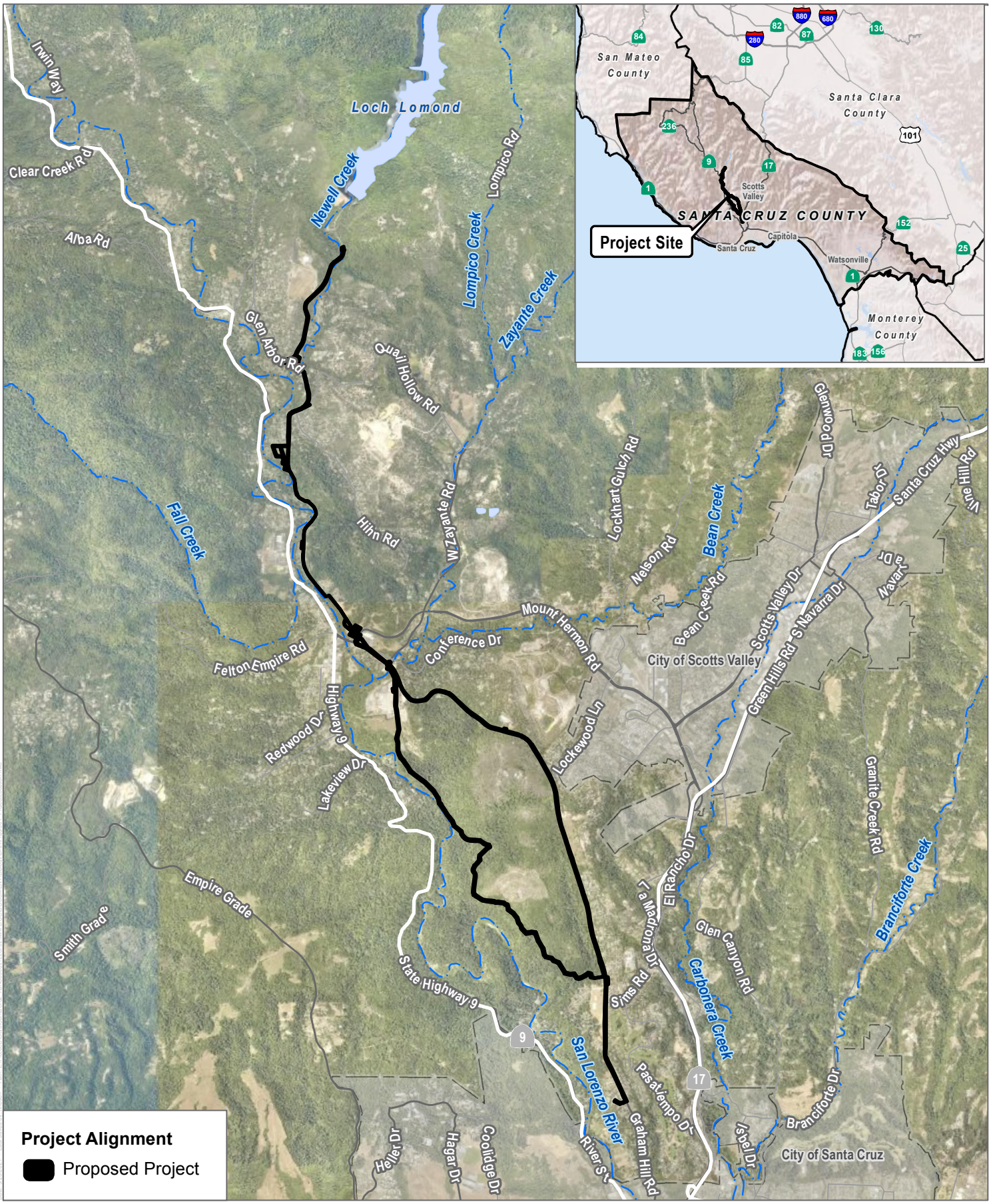
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SOURCE: ESRI 2021, City of Santa Cruz 2021

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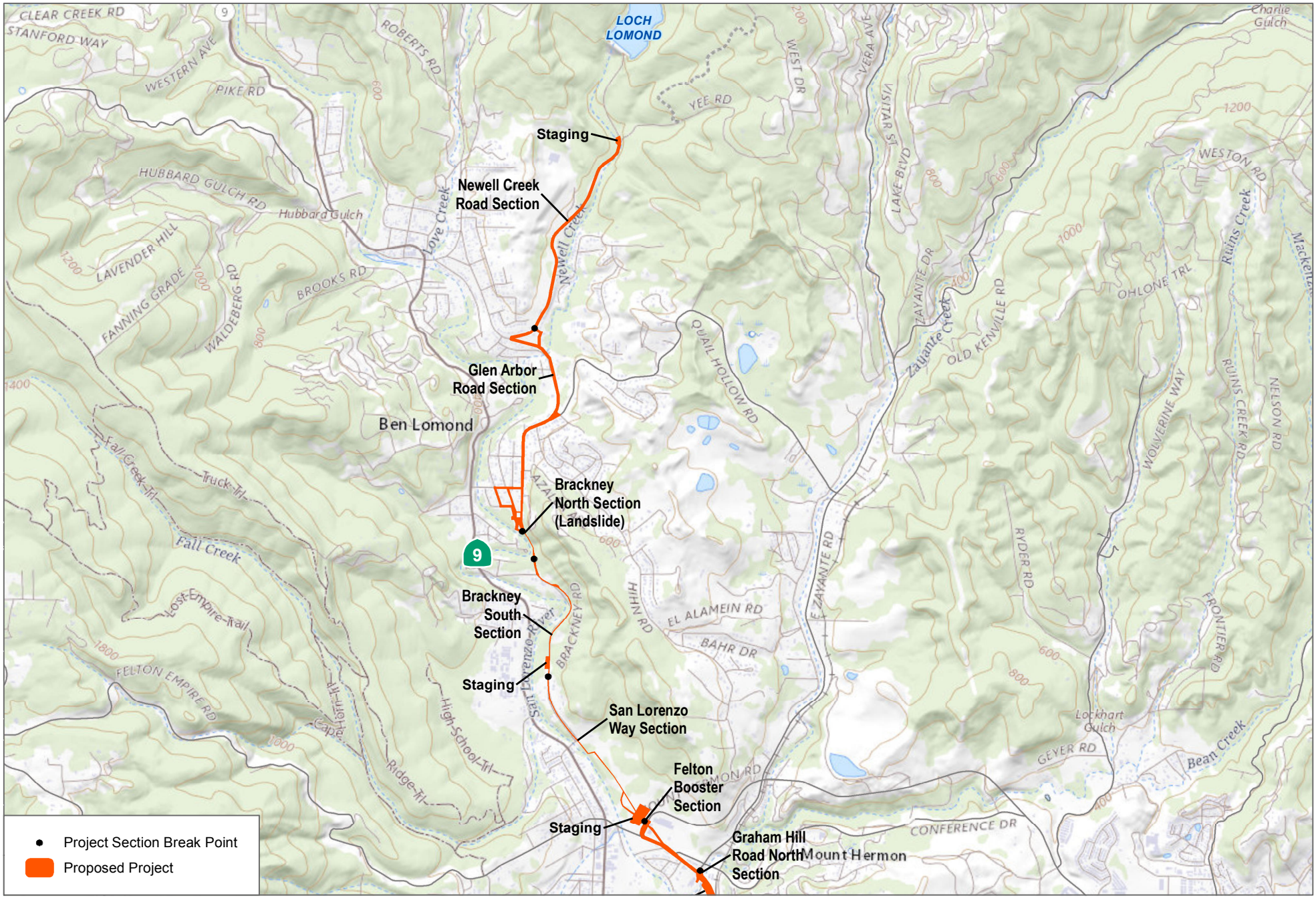
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FIGURE 1

Project Location

Biological Resources Assessment, Newell Creek Pipeline Project

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SOURCE: ESRI 2020, HDR 2019 County of Santa Cruz 2020, City of Santa Cruz Water Department 2020

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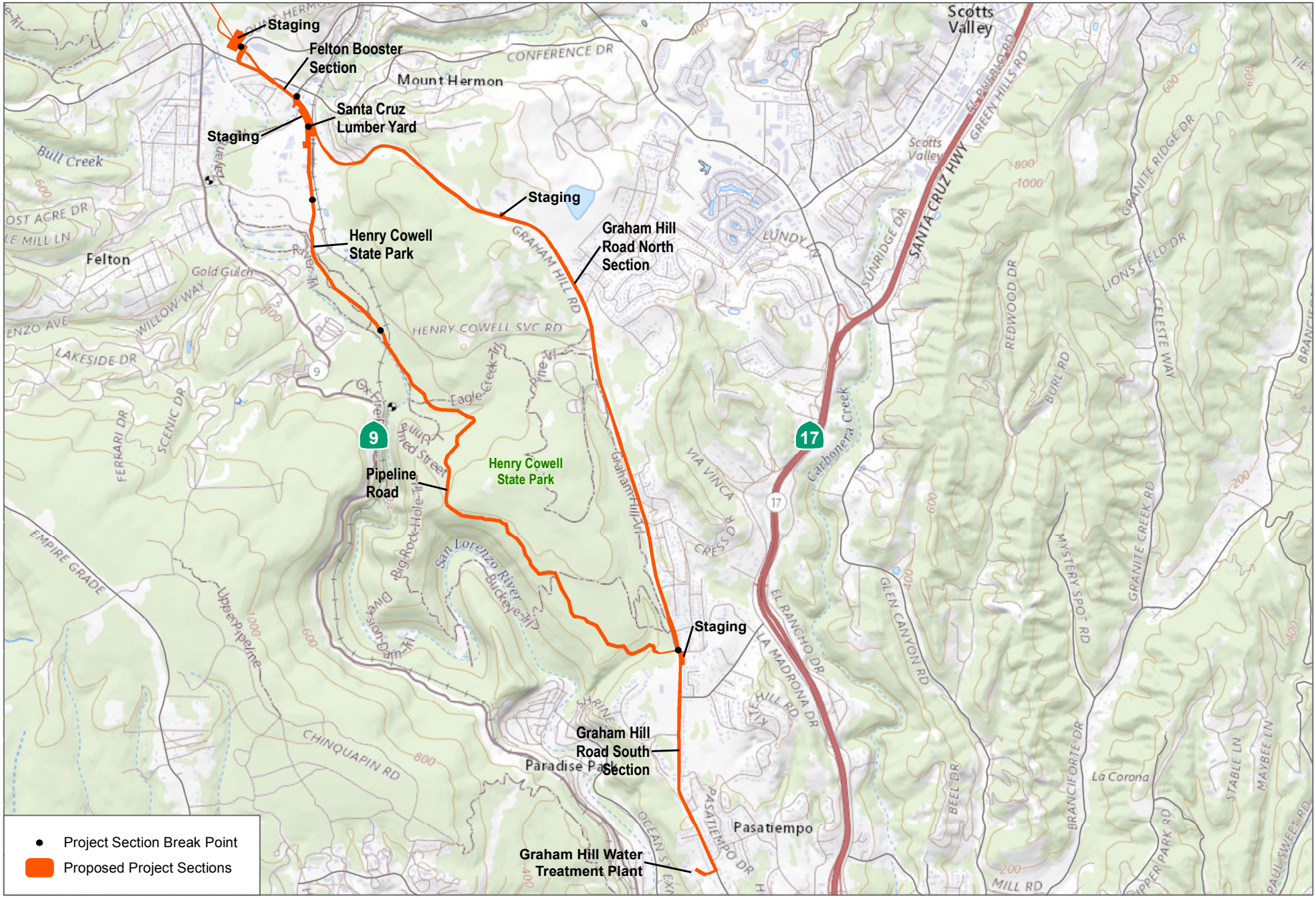
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FIGURE 2-1

Proposed Project - Northern Segment

Biological Resources Assessment, Newell Creek Pipeline Project

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SOURCE: USGS National Map 2021, HDR 2019 County of Santa Cruz 2020, City of Santa Cruz Water Department 2020

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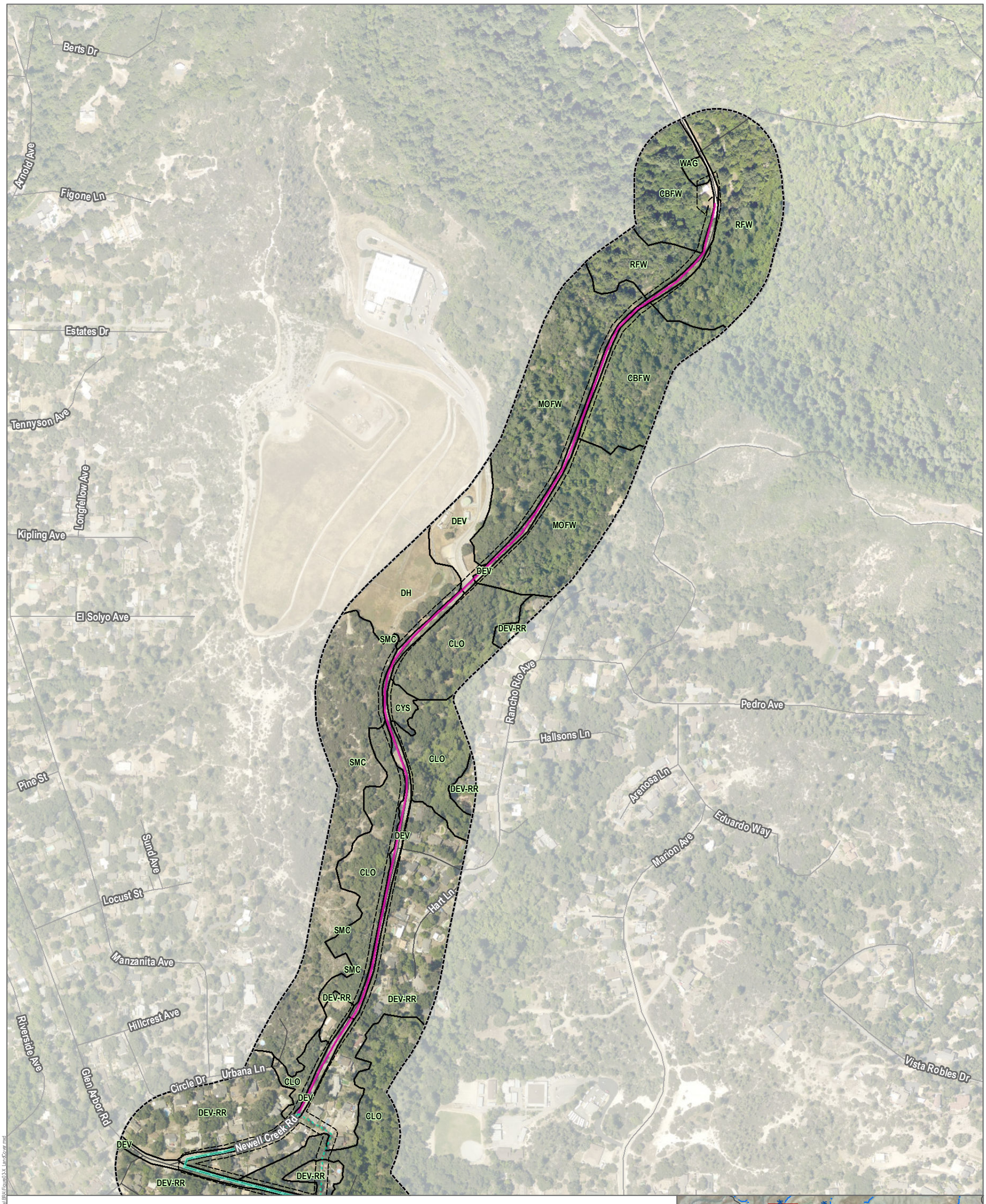
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FIGURE 2-2

Proposed Project - Southern Segment

Biological Resources Assessment, Newell Creek Pipeline Project

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SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020

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0 230 460 Feet

FIGURE 3-1

Vegetation Communities and Land Covers

Biological Resources Assessment, Newell Creek Pipeline Project



- Proposed Alignment Work Area Boundary
- Study Area
- Vegetation Communities and Land Covers
  - BMFW: Bigleaf Maple Forest and Woodland
  - CBFW: California Bay Forest and Woodland
  - CLO: Coast Live Oak Woodland and Forest
  - COB: Coastal Brambles
  - DEV-RR: Rural Residential
  - DEV: Urban/Developed
  - DFFW: Douglas Fir Forest and Woodland
  - DRD: Dirt Road
  - MOFW: Mixed Oak Forest and Woodland
  - RFW: Redwood Forest and Woodland
  - SMC: Silverleaf Manzanita Chaparral

Pipeline Sections

- Brackney North Section (Brackney Landslide Area Pipeline Risk Reduction Project)
- Glen Arbor Road Section
- Newell Creek Road Section
- Glen Arbor Road Section
- Glen Arbor Road Section

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SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020

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FIGURE 3-2

Vegetation Communities and Land Covers

Biological Resources Assessment, Newell Creek Pipeline Project



- Proposed Alignment Work Area Boundary
- Study Area
- Vegetation Communities and Land Covers
  - BMFW: Bigleaf Maple Forest and Woodland
  - CBFW: California Bay Forest and Woodland
  - CLO: Coast Live Oak Woodland and Forest
  - COB: Coastal Brambles
  - CSW: California Sycamore Woodland
  - CYS: Coyote Brush Scrub
  - DEV-RR: Rural Residential
  - DEV: Urban/Developed
  - DFFW: Douglas Fir Forest and Woodland
  - DH: Disturbed Habitat
  - DRD: Dirt Road
  - MOFW: Mixed Oak Forest and Woodland
  - POS: Poison Oak Scrub
  - RFW: Redwood Forest and Woodland

Pipeline Sections

- Brackney North Section (Brackney Landslide Area Pipeline Risk Reduction Project)
- Brackney South Section
- Glen Arbor Road Section
- San Lorenzo Way Section

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SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020

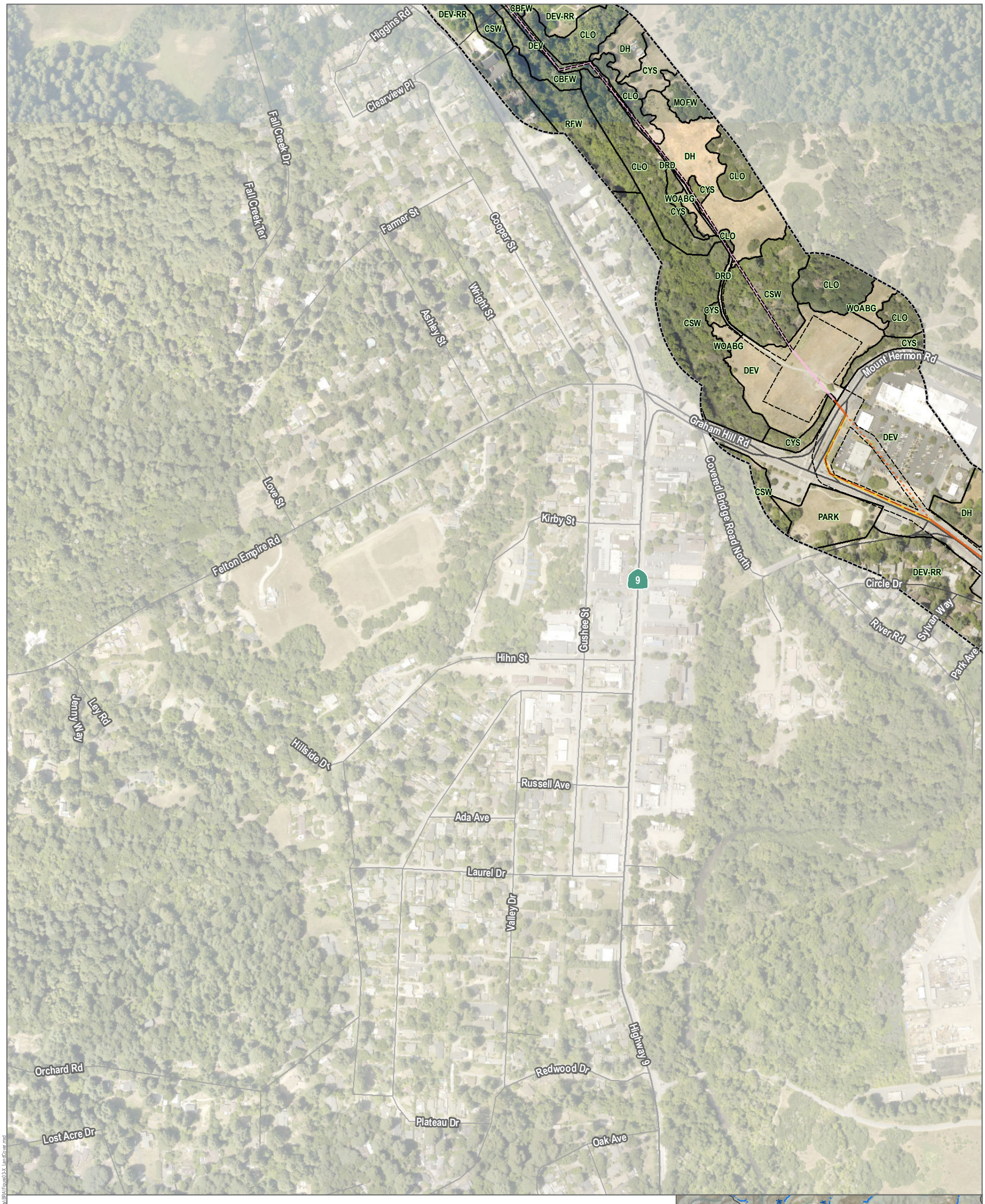
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FIGURE 3-3

Vegetation Communities and Land Covers

Biological Resources Assessment, Newell Creek Pipeline Project



Proposed Alignment Work Area Boundary

Study Area

Vegetation Communities and Land Covers

CBFW: California Bay Forest and Woodland

CLO: Coast Live Oak Woodland and Forest

CSW: California Sycamore Woodland

CYS: Coyote Brush Scrub

DEV-RR: Rural Residential

DEV: Urban/Developed

DH: Disturbed Habitat

DRD: Dirt Road

MOFW: Mixed Oak Forest and Woodland

PARK: Parks

RFW: Redwood Forest and Woodland

WOABG: Wild Oats and Annual Brome Grassland

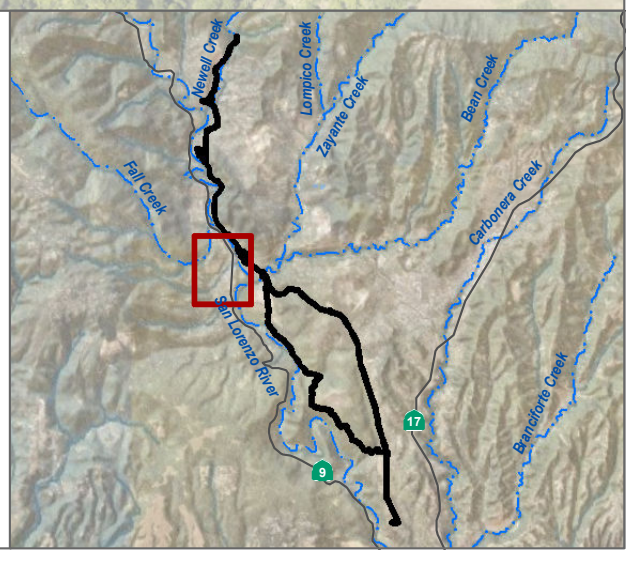
Pipeline Sections

Felton Booster Pump Station Section

San Lorenzo Way Section

Felton Booster Pump Station Section

Felton Booster Pump Station Section



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SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020

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FIGURE 3-4

Vegetation Communities and Land Covers

Biological Resources Assessment, Newell Creek Pipeline Project



Proposed Alignment Work Area Boundary

Study Area

Vegetation Communities and Land Covers

BFW: Box-elder Forest and Woodland

CLO: Coast Live Oak Woodland and Forest

CSW: California Sycamore Woodland

CYS: Coyote Brush Scrub

DEV-RR: Rural Residential

DEV: Urban/Developed

DH: Disturbed Habitat

DRD: Dirt Road

MOFW: Mixed Oak Forest and Woodland

PARK: Parks

PPFW: Ponderosa Pine Forest and Woodland

RFW: Redwood Forest and Woodland

WAG: White Alder Groves

WOABG: Wild Oats and Annual Brome Grassland

Pipeline Sections

Felton Booster Pump Station Section

Graham Hill Road North Section

San Lorenzo Way Section

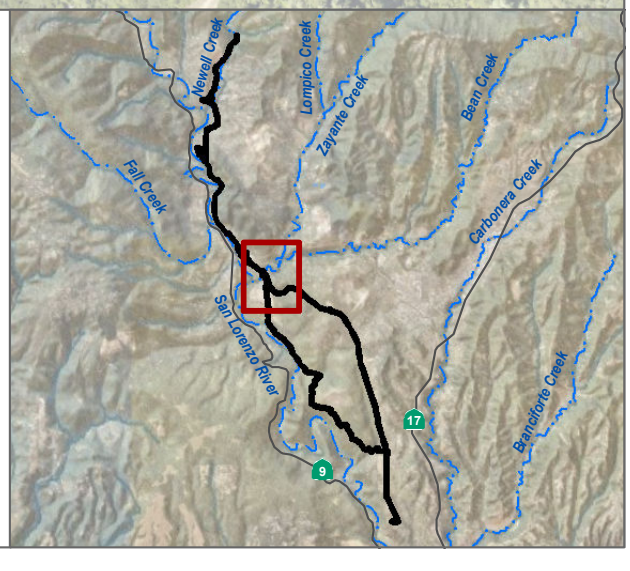
Felton Booster Pump Station Section

Graham Hill Road North Section

Felton Booster Pump Station Section

Henry Cowell State Park

Santa Cruz Lumber Yard



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SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020

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FIGURE 3-5

Vegetation Communities and Land Covers

Biological Resources Assessment, Newell Creek Pipeline Project



SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020

DUDEK

0 230 460 Feet

FIGURE 3-6

Vegetation Communities and Land Covers

Biological Resources Assessment, Newell Creek Pipeline Project



SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020

DUDEK

0 230 460 Feet

FIGURE 3-7

Vegetation Communities and Land Covers

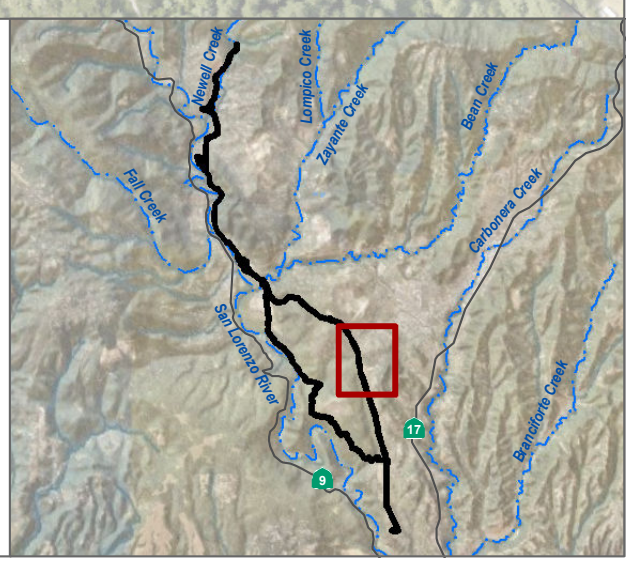
Biological Resources Assessment, Newell Creek Pipeline Project



- Proposed Alignment Work Area Boundary
- Study Area
- Vegetation Communities and Land Covers
  - BCFW: Black cottonwood forest and woodland
  - CLO: Coast Live Oak Woodland and Forest
  - DEV-RR: Rural Residential
  - DEV: Urban/Developed
  - DH: Disturbed Habitat
  - PPFW: Ponderosa Pine Forest and Woodland
  - SMC: Silverleaf Manzanita Chaparral

Pipeline Sections

- Graham Hill Road North Section



SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020

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FIGURE 3-8

Vegetation Communities and Land Covers

Biological Resources Assessment, Newell Creek Pipeline Project

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Proposed Alignment Work Area Boundary

Study Area

Vegetation Communities and Land Covers

CLO: Coast Live Oak Woodland and Forest

DEV: Urban/Developed

DF-TFW: Douglas Fir- Tanoak Forest and Woodland

DFFW: Douglas Fir Forest and Woodland

MOFW: Mixed Oak Forest and Woodland

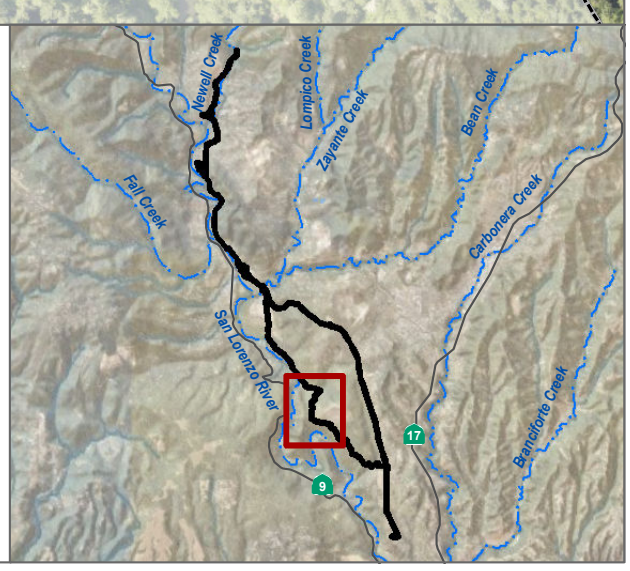
RFW: Redwood Forest and Woodland

SMC: Silverleaf Manzanita Chaparral

WAG: White Alder Groves

Pipeline Sections

Pipeline Road



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SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020

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0 230 460 Feet

FIGURE 3-9

Vegetation Communities and Land Covers

Biological Resources Assessment, Newell Creek Pipeline Project



SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020

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FIGURE 3-10

Vegetation Communities and Land Covers

Biological Resources Assessment, Newell Creek Pipeline Project



SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020

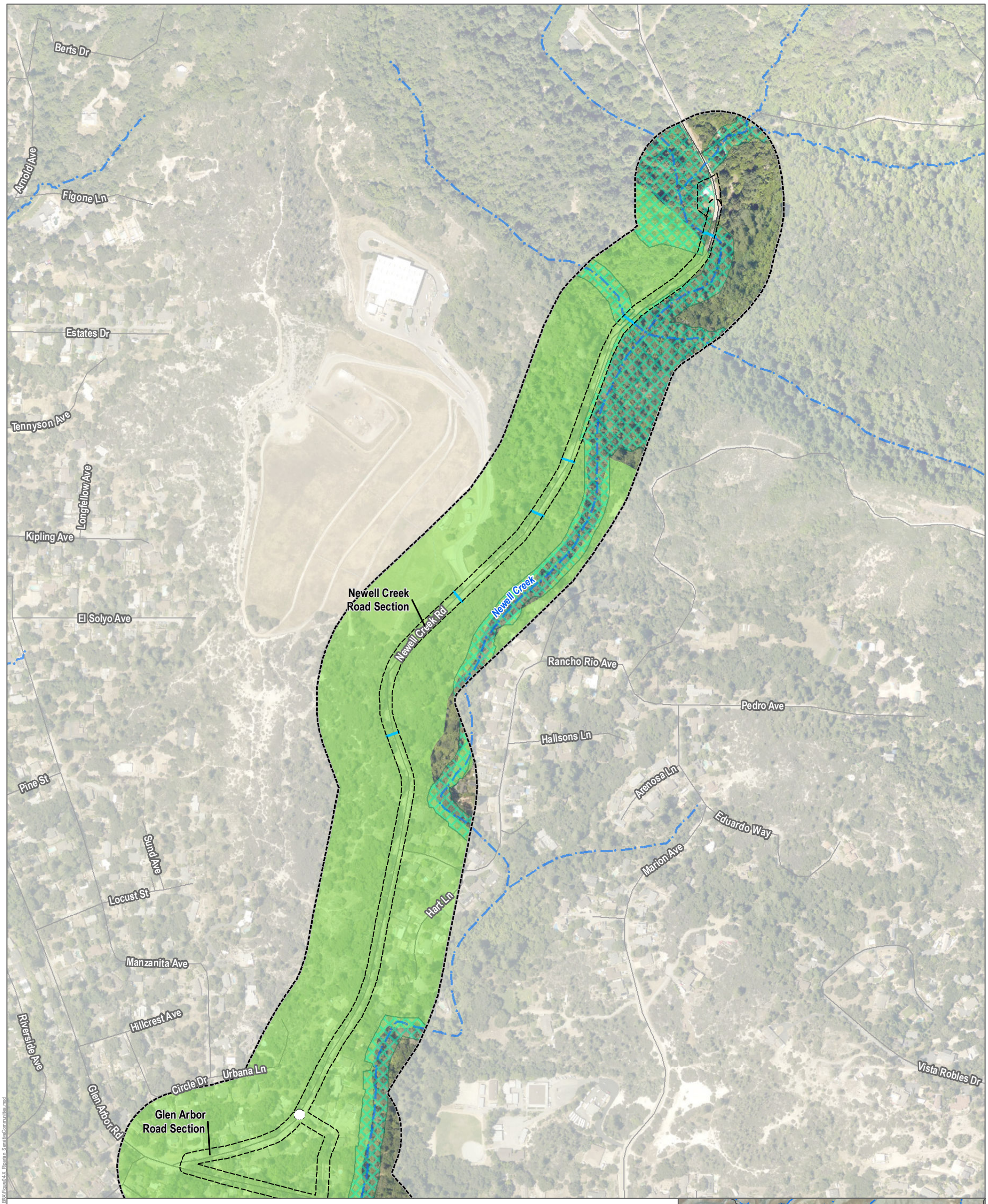
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FIGURE 3-11

Vegetation Communities and Land Covers

Biological Resources Assessment, Newell Creek Pipeline Project



SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020, McGraw 2021

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FIGURE 4-1

Sensitive Vegetation Communities and Potentially Jurisdictional Aquatic Resources

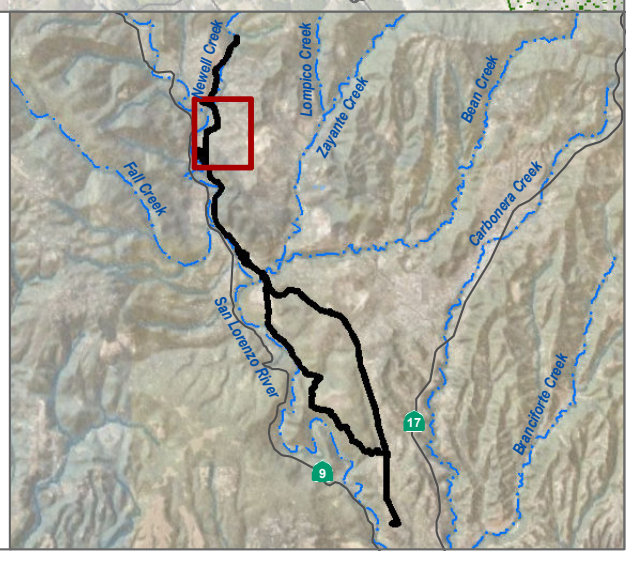
Biological Resources Assessment, Newell Creek Pipeline Project

Riverside Ave
Circle Dr
Newell Creek Road Section
Newell Creek Rd
Vista Robles Dr
Glen Arbor Rd
Madrone Ave
Riverside Railroad Dr
Riverside Park Dr
Newell Creek
Kessler Dr
Marion Ave
Shadowbrook Rd
Maple Ave
Quail Hollow Rd
Cumora Ln
Hidden Valley Dr
Woodview Dr
Webster Dr
Quail Ter
9
Holida Ln
Glen Arbor Road Section
Noteware Dr
Arboleda Way
Lorenzo Way
Larita Ave
Clement St
Eleana Dr
Woodston Ave
Morningside Dr
Arden Ave
Larita Dr
Archer Way
San Lorenzo River
Hermosa Ave
Fremont Ave
Hihn Rd
Fernwood Ave
Tip ping Way
Oak Ave
Balch Way
Azalea Ave
Caledonium Ave
Locust Ln
Condor Ave
Ridgeview Dr
Brackney North Section (Landslide)
Hunt Way
Sunnycroft Rd
Melin Ave
Stanford Dr
Harvard Dr

Proposed Alignment Work Area Boundary
Project Section Break Point
Study Area
Special Forests (Santa Cruz County 2020)
Sandhills Ecosystems (McGraw 2021)
Riparian Communities (Dudek 2021)

Potentially Jurisdictional Aquatic Resources

Streams (Dudek 2021)
Streams (Santa Cruz County 2020)



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SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020, McGraw 2021

DUDEK

0 230 460 Feet

FIGURE 4-2

Sensitive Vegetation Communities and Potentially Jurisdictional Aquatic Resources

Biological Resources Assessment, Newell Creek Pipeline Project

Brackney North Section (Landslide)
Brackney South Section
San Lorenzo Way Section
Locust Ln
Hunt Way
Sunnycroft Rd
San Lorenzo River
Cottage Ave
Bridge St
Brackney Rd
Condor Ave
Melin Ave
Ridgeview Dr
Stanford Dr
Harvard Dr
Crown Dr
Hillview Dr
Lazywoods Rd
El Solyo Heights Dr
Capelli Dr
Hacienda Way
Hihn Rd
9
Fall Creek Dr
Fall Creek
Higgins Rd
Clearview Pl
Cooper St
Rose Acres Ln
San Lorenzo Way

Proposed Alignment Work Area Boundary
Project Section Break Point
Study Area
Special Forests (Santa Cruz County 2020)
Sandhills Ecosystems (McGraw 2021)
Riparian Communities (Dudek 2021)

Potentially Jurisdictional Aquatic Resources

Streams (Dudek 2021)
Streams (Santa Cruz County 2020)

Newell Creek
Lompico Creek
Zayante Creek
Bean Creek
Carbonera Creek
Fall Creek
San Lorenzo River
Branciforte Creek
17
9

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SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020, McGraw 2021

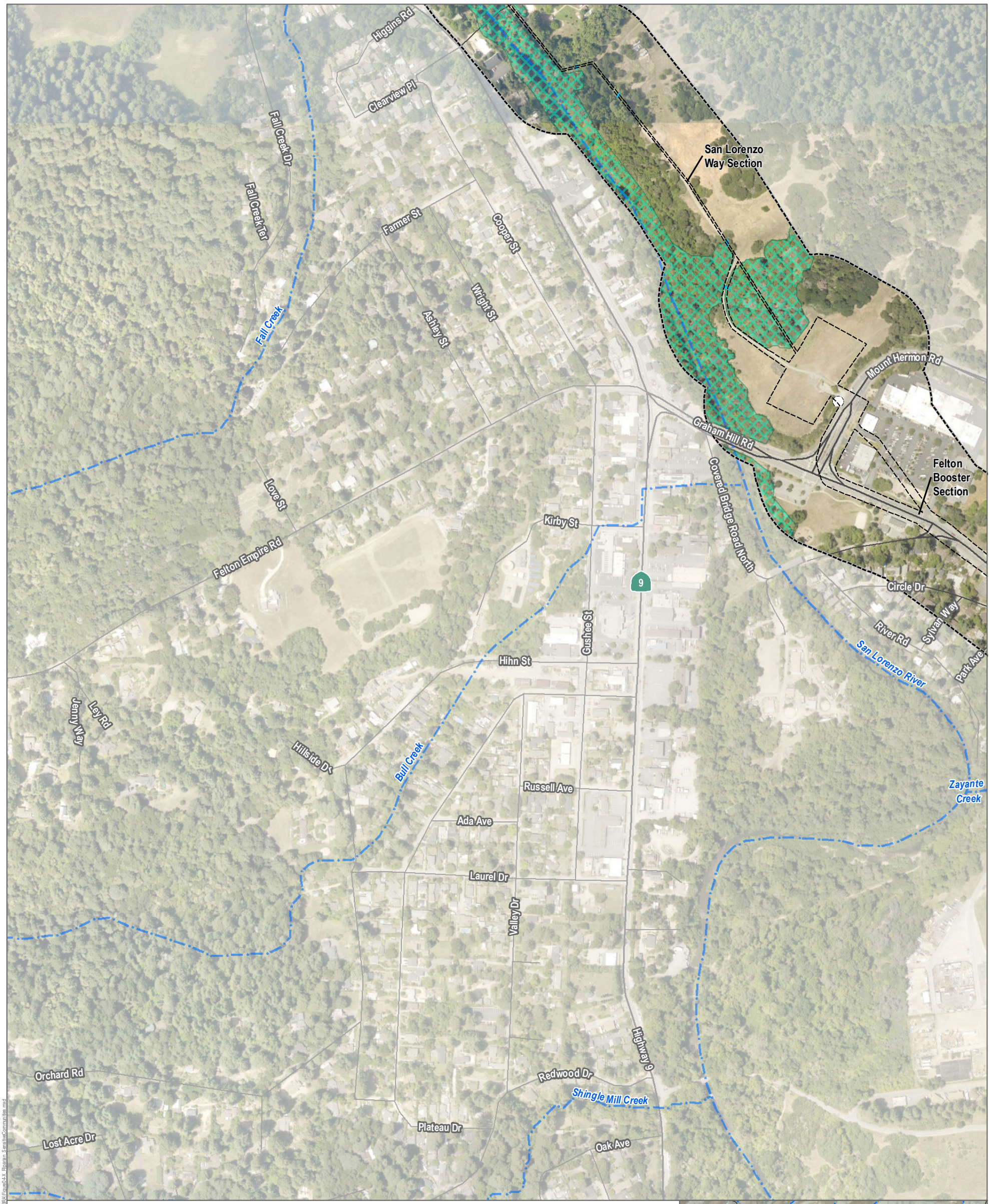
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FIGURE 4-3

Sensitive Vegetation Communities and Potentially Jurisdictional Aquatic Resources

Biological Resources Assessment, Newell Creek Pipeline Project



SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020, McGraw 2021

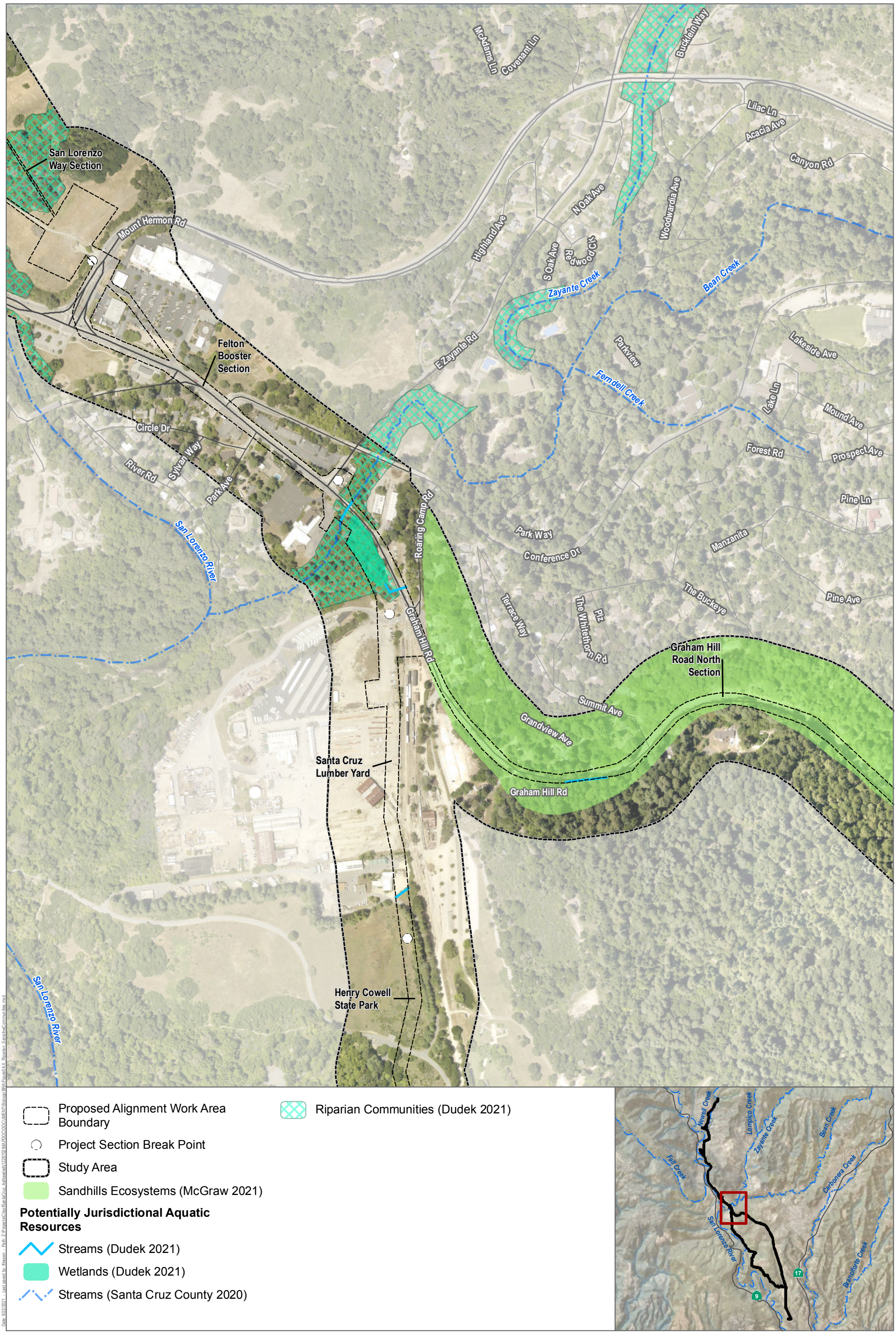
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FIGURE 4-4

Sensitive Vegetation Communities and Potentially Jurisdictional Aquatic Resources

Biological Resources Assessment, Newell Creek Pipeline Project



SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020, McGraw 2021

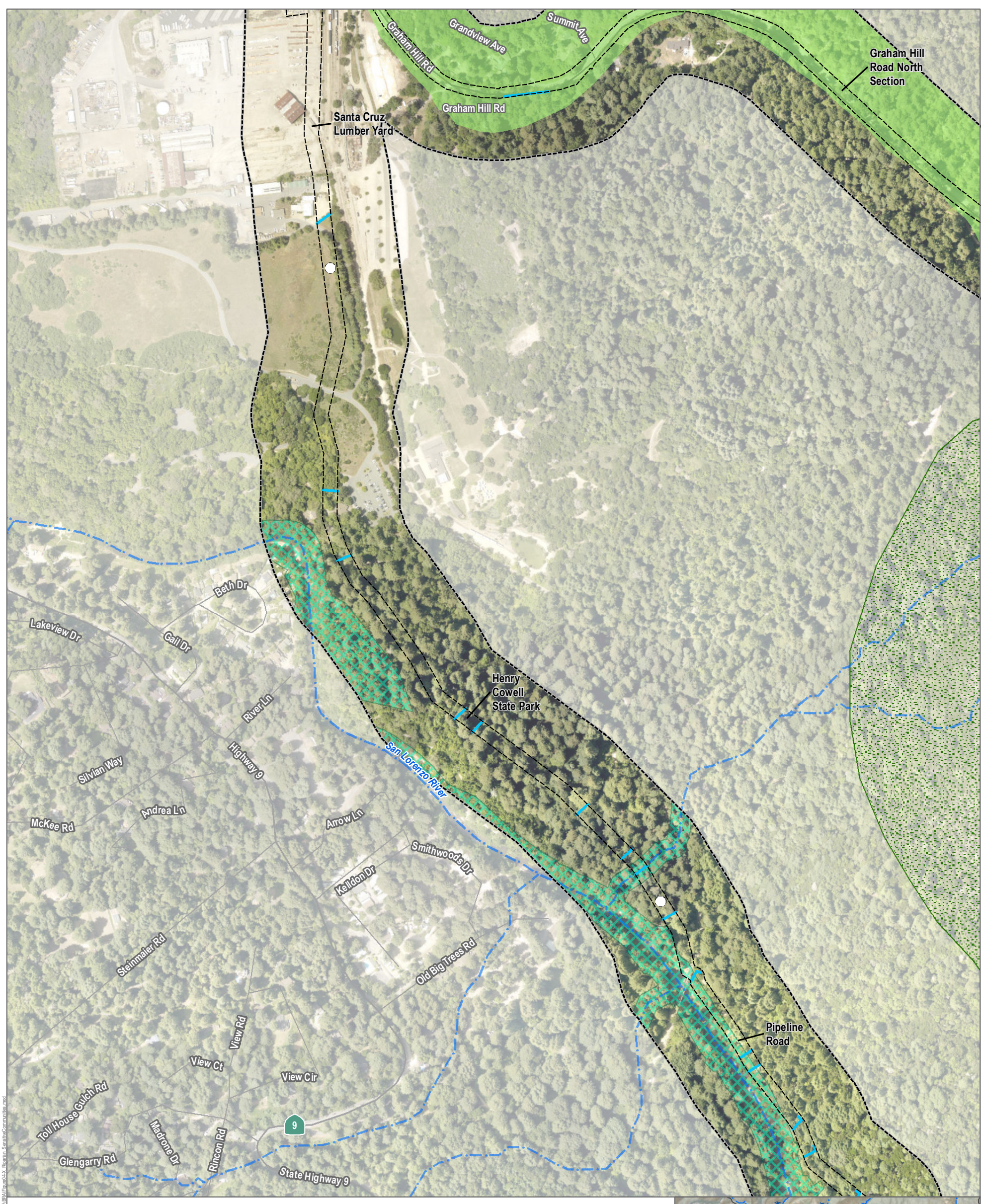
DUDEK

0 230 460 Feet

FIGURE 4-5

Sensitive Vegetation Communities and Potentially Jurisdictional Aquatic Resources

Biological Resources Assessment, Newell Creek Pipeline Project



SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020, McGraw 2021

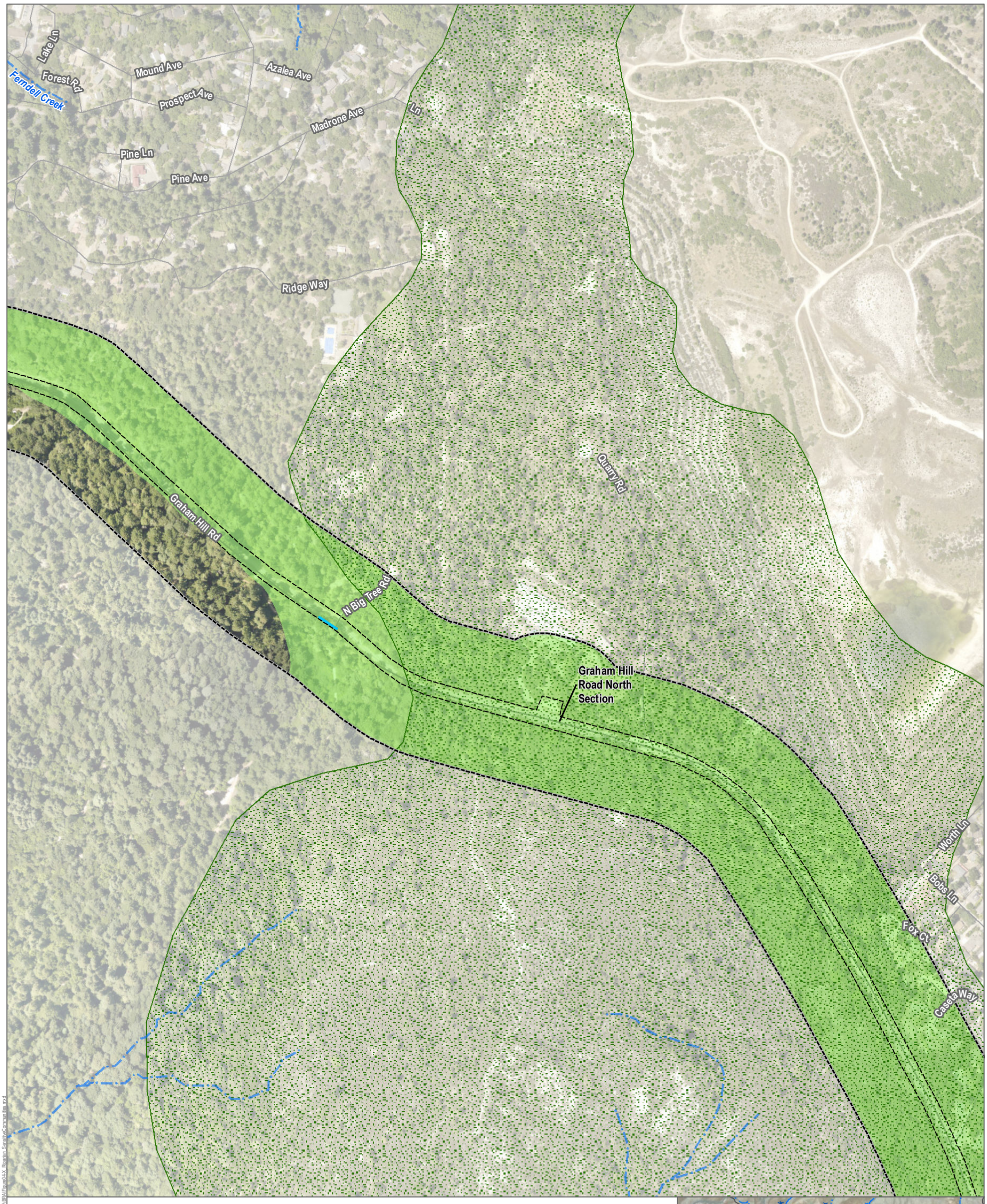
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FIGURE 4-6

Sensitive Vegetation Communities and Potentially Jurisdictional Aquatic Resources

Biological Resources Assessment, Newell Creek Pipeline Project



SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020, McGraw 2021

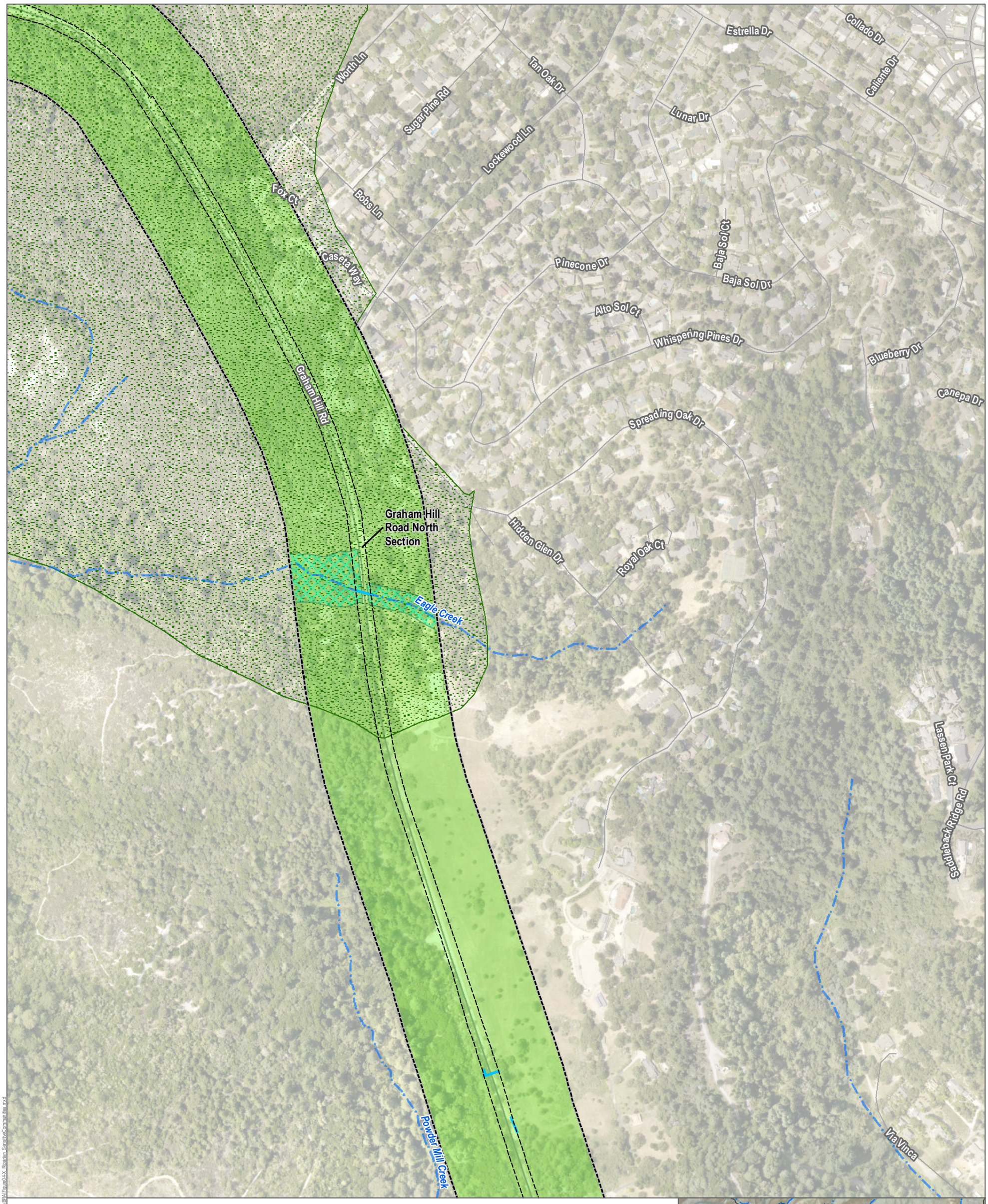
DUDEK

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FIGURE 4-7

Sensitive Vegetation Communities and Potentially Jurisdictional Aquatic Resources

Biological Resources Assessment, Newell Creek Pipeline Project



SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020, McGraw 2021

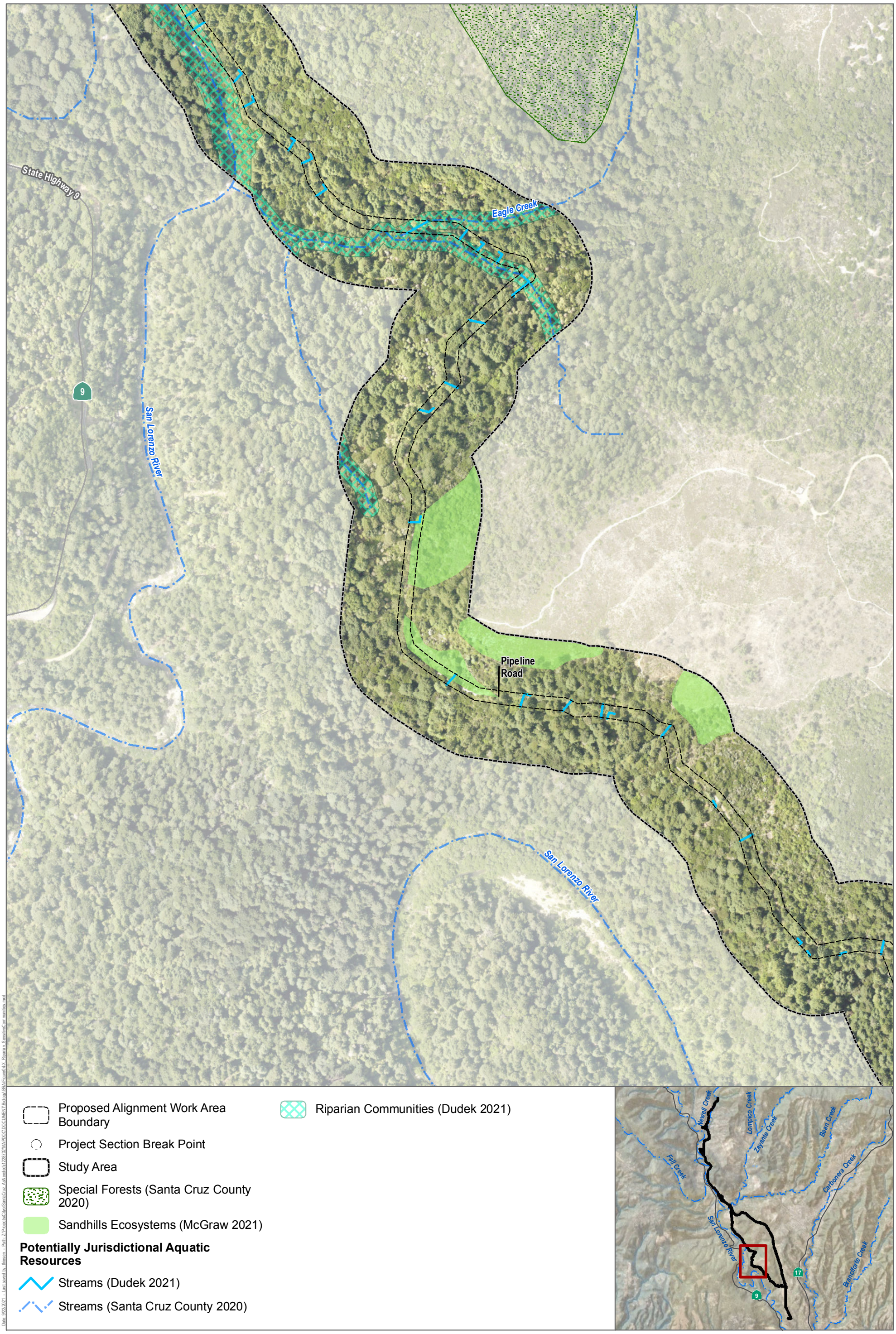
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FIGURE 4-8

Sensitive Vegetation Communities and Potentially Jurisdictional Aquatic Resources

Biological Resources Assessment, Newell Creek Pipeline Project



SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020, McGraw 2021

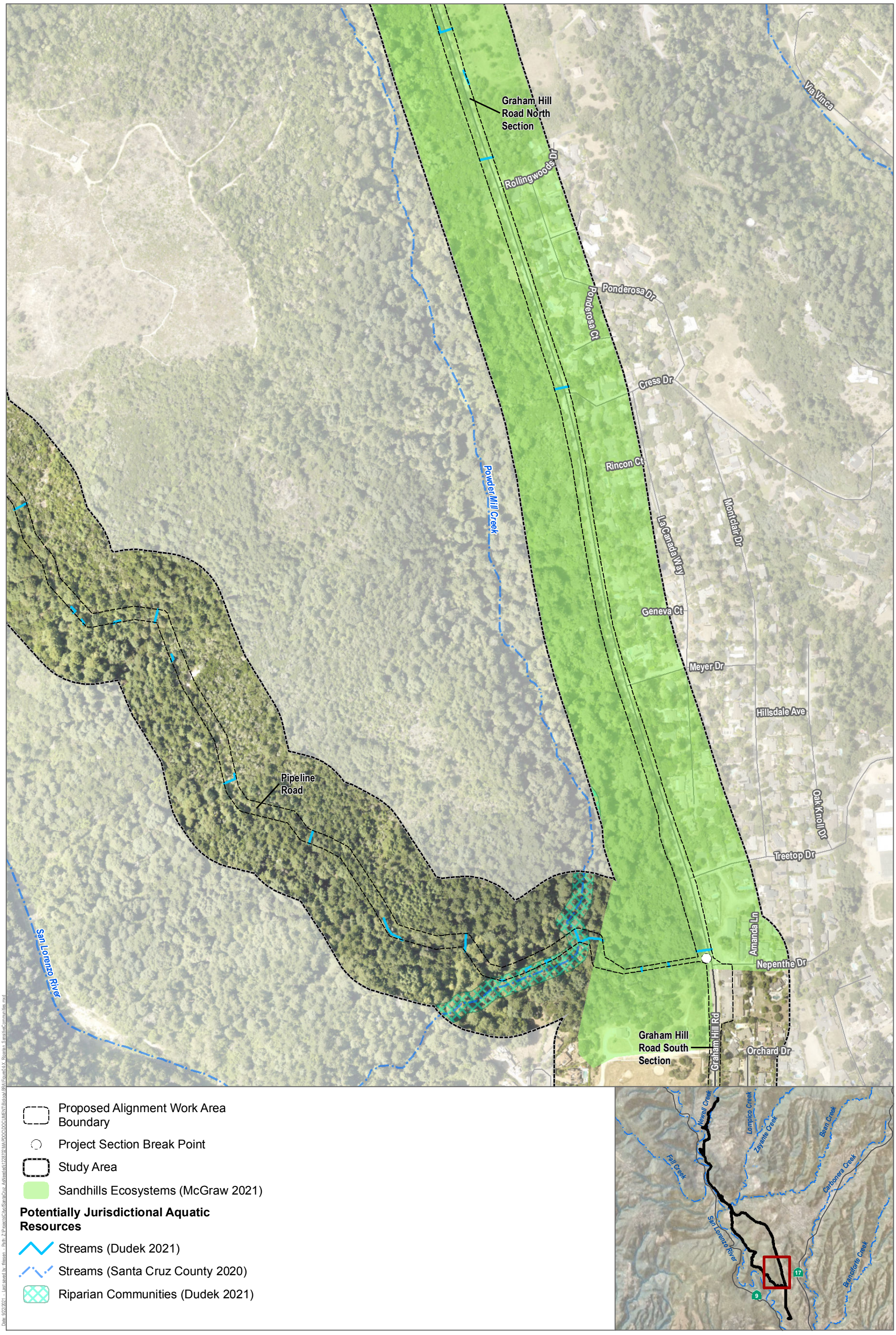
DUDEK

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FIGURE 4-9

Sensitive Vegetation Communities and Potentially Jurisdictional Aquatic Resources

Biological Resources Assessment, Newell Creek Pipeline Project



SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020, McGraw 2021

DUDEK

0 230 460 Feet

FIGURE 4-10

Sensitive Vegetation Communities and Potentially Jurisdictional Aquatic Resources

Biological Resources Assessment, Newell Creek Pipeline Project

Nepenthe Dr
Santa Cruz Hwy
La Madrona Dr
Powder Mill Creek
Orchard Dr
Graham Hill Road South Section
Pied Piper Ln
Firehouse Ln
Sims Rd
Kite Hill Rd
Lawridge Rd
Panorama Ln
Shrine Way
Palomino Way
Henry Cowell Dr
San Lorenzo River
Bridlewood Ct
Deer Path Rd
Moreno Dr
Pasatiempo Dr
Ocean Street Extension
Creek Ln
Hidde
Brooktree Ln
Clubhouse Rd
Mosswood Ct
Ridge Ln
Oak Rd
Westwood Rd
Keystone Way
San Lorenzo River
Moss Ln
Saint Alban St
State Highway 9
Saint Bernard St
Quail Crossing
Graham Hill Rd
Hollins Dr
9

Proposed Alignment Work Area Boundary

Project Section Break Point

Study Area

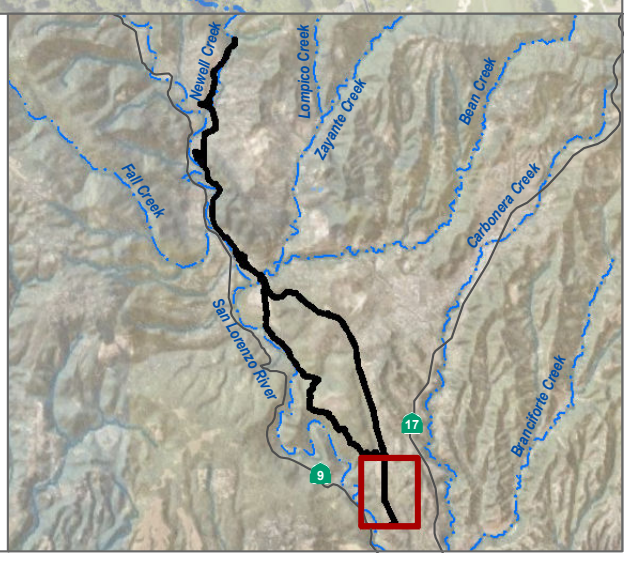
Sandhills Ecosystems (McGraw 2021)

Potentially Jurisdictional Aquatic Resources

Streams (Dudek 2021)

Streams (Santa Cruz County 2020)

Riparian Communities (Dudek 2021)



Date: 9/22/2021 - Last saved by: tfriesen - Path: Z:\Projects\Civic\SantaCruz_Ashlestad\123870\MAPDOC\DOCUMENT\Bridlewl\BRA\Figure\4-X_Riparian_SensitiveCommunities.mxd

SOURCE: ESRI Imagery (Accessed 2021), County of Santa Cruz 2020, McGraw 2021

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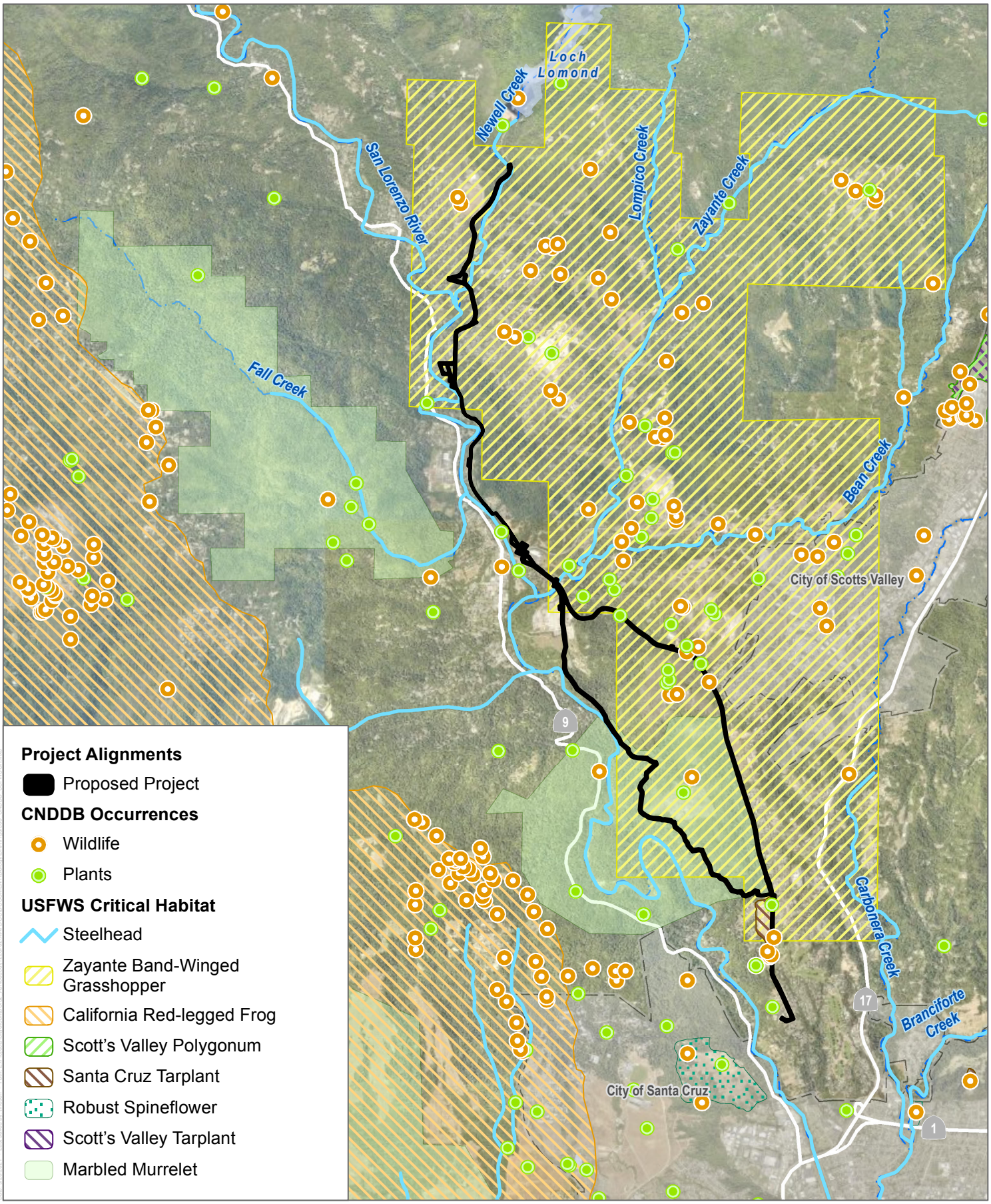
0 230 460 Feet

FIGURE 4-11

Sensitive Vegetation Communities and Potentially Jurisdictional Aquatic Resources

Biological Resources Assessment, Newell Creek Pipeline Project

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SOURCE: ESRI 2021, City of Santa Cruz 2021, CDFW 2021, USFWS 2020

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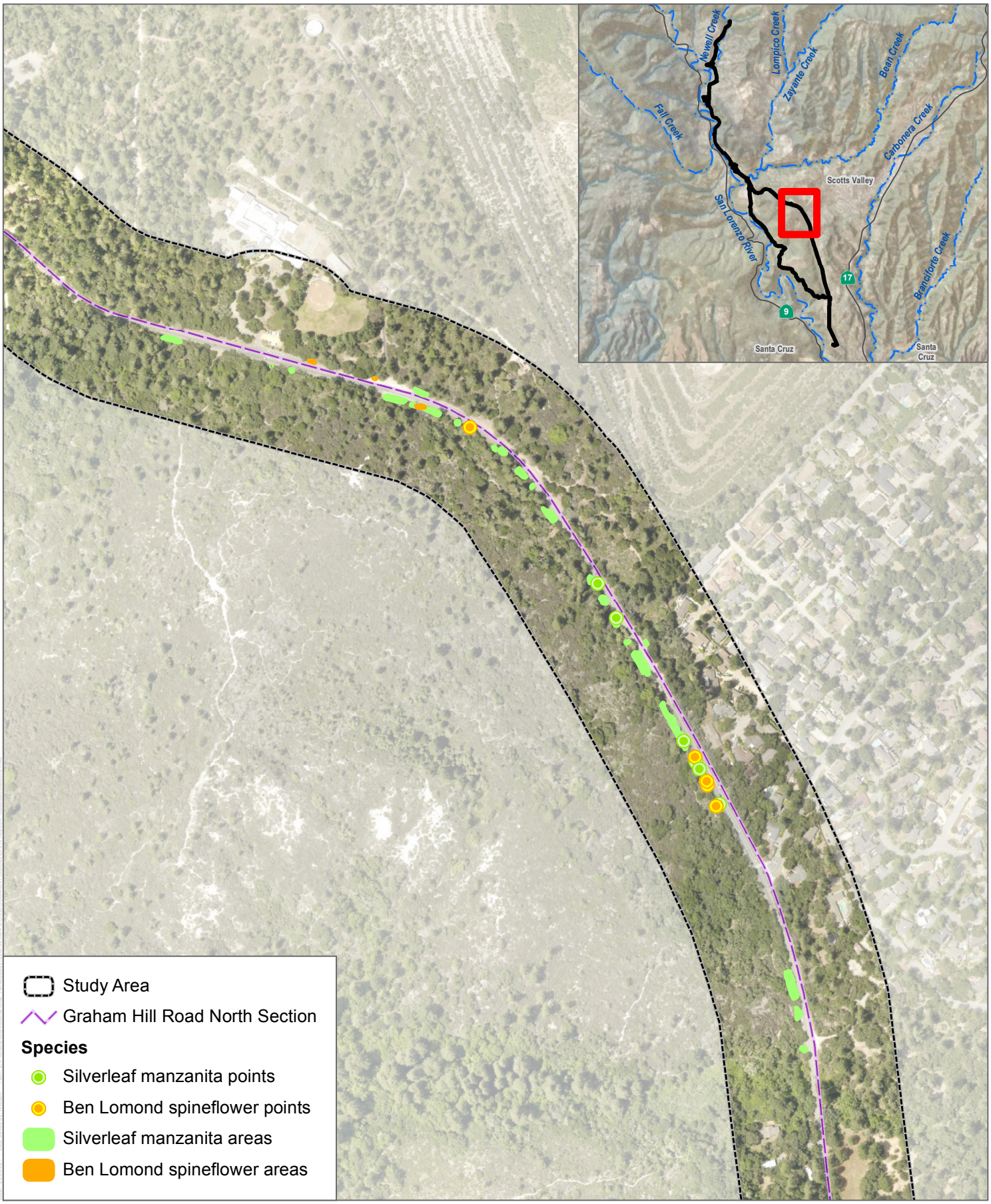
0 0.5 1 Miles

FIGURE 5

Historical Special-Status Species Locations and USFWS Critical Habitat

Biological Resources Assessment, Newell Creek Pipeline Project

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SOURCE: ESRI 2021, City of Santa Cruz 2021, McGraw 2021

DUDEK

0 0.0475 0.095 Miles

FIGURE 6

Special-Status Species Locations

Biological Resources Assessment, Newell Creek Pipeline Project

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Appendix A
Site Photographs



Photo 1: Northern Segment – Newell Creek Road Section

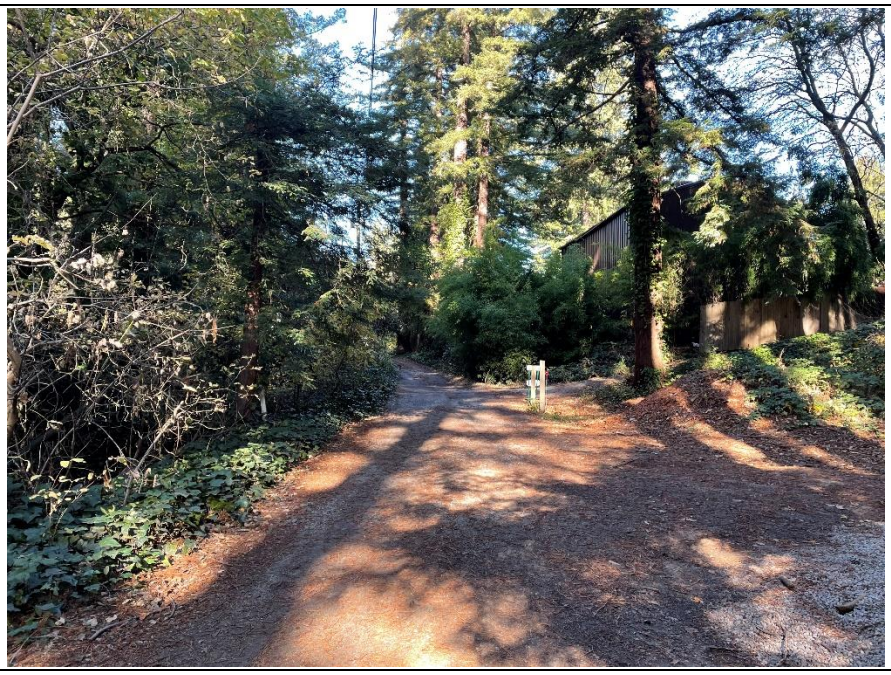


Photo 2: Northern Segment – Glen Arbor Road Section.



Photo 3: Northern Segment – Brackney North Section



Photo 4: Northern Segment – Brackney South Section



Photo 5: Northern Segment – San Lorenzo Road Section



Photo 6: Northern Segment – Felton Pump Station Section



Photo 7: Southern Segment – Santa Cruz Lumber Yard Section



Photo 8: Southern Segment – Henry Cowell State Park Section



Photo 9: Southern Segment – Pipeline Road Section



Photo 10: Southern Segment – Graham Hill Road North Section



Photo 11: Southern Segment – Graham Hill Road North Section (Zayante Creek)



Photo 12: Southern Segment – Graham Hill Road South Section

Appendix B

Sandhills Habitat Assessment

SANDHILLS HABITAT ASSESSMENT FOR THE NEWELL CREEK PIPELINE REPLACEMENT PROJECT



Prepared by:

Jodi McGraw, Ph.D.
Jodi McGraw Consulting
PO Box 221 • Freedom, CA 95019 • (831) 768-6988
jodi@jodimcgrawconsulting.com
www.jodimcgrawconsulting.com

Submitted to:

DUDEK
1630 San Pablo Avenue, Suite 300
Oakland, CA 94612

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1 Introduction

1.1 Project

The City of Santa Cruz Water Department (SCWD) is planning to implement the Newell Creek Pipeline Replacement Project, which will install a new pipeline to convey water from the Loch Lomond Reservoir to the Graham Hill Water Treatment Plant. Currently, water is conveyed from the Newell Creek Dam, which creates the reservoir, to the water treatment plant via the 9.25-mile Newell Creek Pipeline (Figure 1). The pipeline was constructed in 1960 and is reaching the end of its useful life; accordingly, the City has conducted a series of technical studies to evaluate replacement and/or rehabilitation alternatives.

Based on its prior analysis, SCWD proposes to replace 8.75 miles of the existing pipeline with a new 24- to 30-inch pipe. The pipeline would generally be installed underneath existing, paved roads, in the road right-of-way (ROW), and/or existing SCWD easements. The proposed northern segment from Newell Creek Access Road Bridge to the Felton Booster Pump Station would generally follow the existing pipeline alignment, with a few short re-alignments to avoid crossing private property; wherever possible, the new pipeline would be installed parallel to the existing pipeline. The proposed southern NCP segment, which extends from the booster pump station to the water treatment plant, generally includes a new pipeline section along Graham Hill Road. Once the new pipeline is installed and the interconnections are made, the existing pipeline would be removed or abandoned in place (DUDEK 2020).

1.2 Sandhills Ecosystem and Species

The proposed project occurs within central Santa Cruz County, which features the Santa Cruz Sandhills (Sandhills)—an endemic ecosystem found on outcroppings of Zayante Sand Soil in central Santa Cruz County (Marangio and Morgan 1987, McGraw 2004b). The Sandhills support four endemic plants, two of which are federally listed as endangered and one of which is also state listed as endangered, and two endemic insects that are both federally endangered (Table 1). The Sandhills also support Santa Cruz kangaroo rat (*Dipodomys venustus venustus*), which is currently only known from two locations, one of which is in the Sandhills (Table 1).

1.3 Assessment Goal and Objectives

To assist SCWD with planning and permitting of the project, Jodi McGraw Consulting (JMc) conducted a habitat assessment to evaluate the occurrence of Sandhills ecosystems, communities, and special-status species within proposed and alternative pipeline alignments. The objectives of the assessment were to:

1. **Synthesize existing information** including plans, reports, and spatial data (i.e., geographic information systems data) to identify known or likely occurrences of Sandhills systems in the region;
2. **Map the Sandhills ecosystem**, using existing data, on-the-ground assessments of accessible areas, and remote sensing (i.e., analysis of aerial imagery) within 300 feet of the Proposed Project Sections and Alternative Sections (Figure 1);

Table 1: Special-Status Plants and Animals of the Santa Cruz Sandhills

Name	Status[1]	Habitat
Santa Cruz kangaroo rat (*Dipodomys venustus venustus*)	Special Animal	Shrub-dominated communities on sandy soils in the Santa Cruz Mountains, including silverleaf manzanita chaparral
Mount Hermon June beetle (*Polyphylla barbata*)	Federally Endangered	Zayante soil and adjacent transitional soils in central Santa Cruz County
Zayante band-winged grasshopper (*Trimerotropis infantilis*)	Federally Endangered	Open sand parkland and adjacent chaparral gaps with sparse herbaceous understory
Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*)	Federally Endangered; CRPR 1B.1	Openings in sand parkland and chaparral gaps, away from woody vegetation, dense grasses, and litter
Ben Lomond buckwheat (*Eriogonum nudum* var. *decurrens*)	CRPR 1B.1	Sand parkland and chaparral canopy gaps as well as areas of sparse canopy cover in ponderosa pine forest and coast live oak woodland
Ben Lomond wallflower (*Erysimum teretifolium*)	Federally Endangered; California Endangered; CRPR 1B.1	Openings in sand parkland and chaparral canopy gaps, away from woody vegetation, dense grasses, and litter
Silverleaf (Bonny Doon) manzanita (*Arctostaphylos silvicola*)	CRPR 1B.2	Silverleaf manzanita chaparral, and understory of ponderosa pine forest

[1] Status Designation Descriptions

Federally Endangered: Listed under the Federal Endangered Species Act; species in danger of extinction throughout all or significant portions of its range.

Special Animal: On the California Department of Fish and Wildlife list of Special Animals (CDFW 2019).

State Endangered: Listed on the California Endangered Species Act; species whose continued existence in California is jeopardized.

California Rare Plant Rank (CRPR) 1B (CNPS 2021): Most plants in this category are endemic to California and have experienced significant declines over several decades; these plants are rare, threatened, or endangered throughout California and elsewhere. Decimals represent a "Threat Rank" (e.g., "List 1B.1"):

CRPR 1B.1: Seriously threatened populations in California, with over 80% of occurrences are threatened.

CRPR 1B.2: Marginally threatened populations in California, with between 20% and 80% of occurrences threatened.

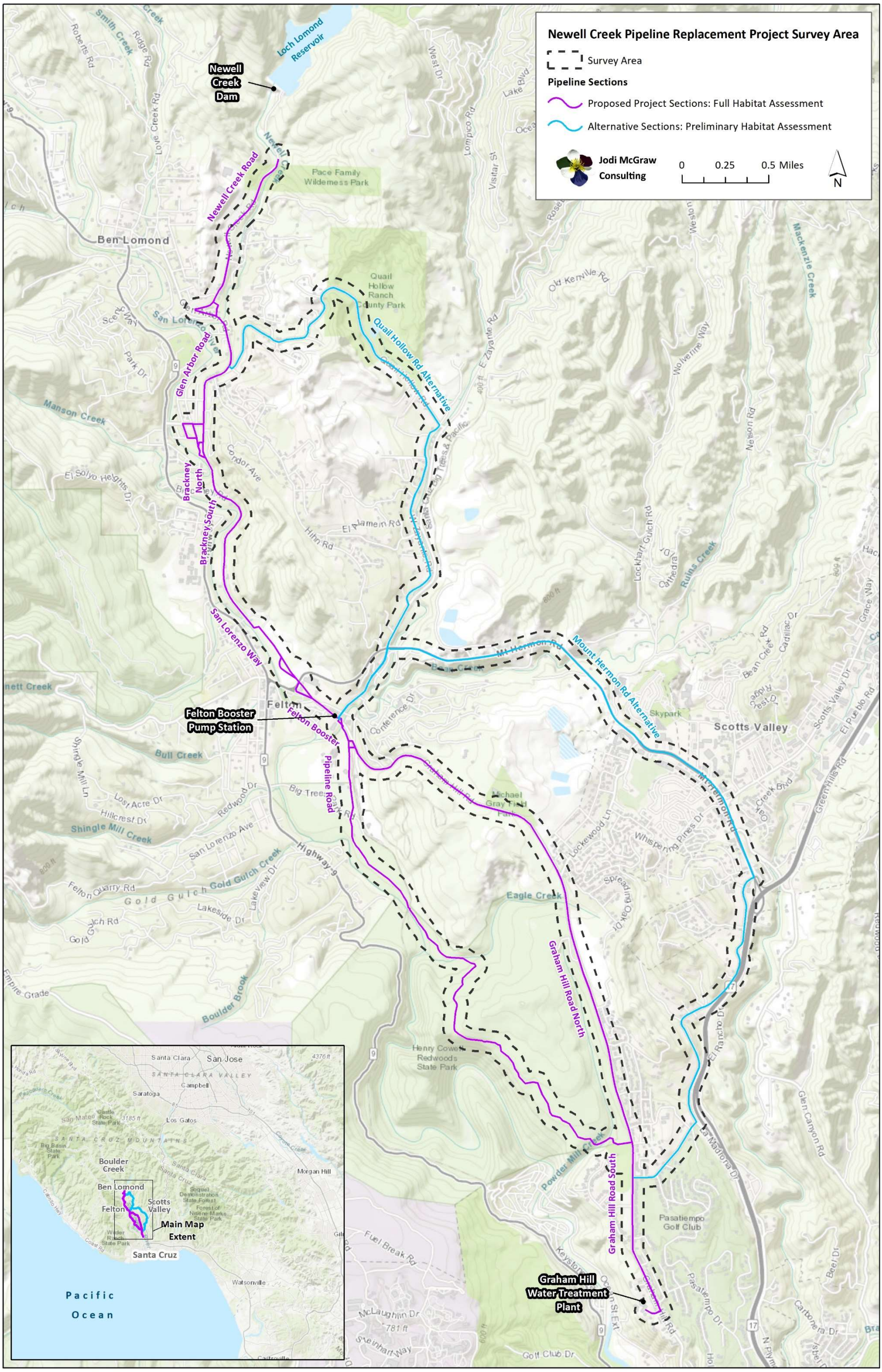


Figure 1: Newell Creek Pipeline Replacement Project Survey Area

3. **Characterize and map Sandhills communities** within the Proposed Project Sections (only), and evaluate their condition including land uses, succession, or transitional soil conditions, among other factors, that can influence their use by special-status species; and
4. **Assess habitat for seven special-status Sandhills species (Table 1),** based on the community type and condition, as well as proximity to occupied habitat, and observations made during the assessment.

1.4 Report

The *Methods* (Section 2) outlines how habitat assessment objectives were achieved while the *Results* (section 3) describes the findings. The information in this habitat assessment can inform SCWD's efforts to plan and permit the project; specifically, it can aid evaluation of the proposed and alterative projects under the California Environmental Quality Act (CEQA) and help inform development of mitigations to reduce impacts of the project on sensitive biological resources as part of CEQA and in compliance with the Federal Endangered Species Act. Specific recommendations will be developed as part of a subsequent phase of this Sandhills component of the project.

2 Methods

2.1 Study Region

The Newell Creek Pipeline Replacement Project (Project) Area is located in the San Lorenzo Valley and adjacent Scotts Valley areas in central Santa Cruz County, between the City of Santa Cruz to the south, the town of Ben Lomond to the north and west, and the City of Scotts Valley in the east (Figure 1). The region features a relatively high concentration of Zayante soils that support the Sandhills ecosystem (McGraw 2004b).

2.2 Assessment Areas and Approach

The habitat assessment evaluated the occurrence of Sandhills systems (ecosystems, communities, and special-status species) within nine pipeline sections that total 22.69 miles. These include 13.08 (58% of the total length) within the Proposed Project and 9.60 miles (42%) of total within the two Alternative Sections (Table 2, Figure 1).

Table 2: Project Pipeline Sections subject to Two Levels of Sandhills Assessment

Assessment Type and Pipeline Section	Length (feet)	Miles	% of Total
Proposed Project Sections Subject to Full Habitat Assessment	**69,073**	**13.08**	**58%**
Brackney North Section	734	0.14	1%
Brackney South Section	3,320	0.63	3%
Felton Booster Section	2,617	0.50	2%
Glen Arbor Road Section	9,545	1.81	8%
Graham Hill Road North Section	18,385	3.48	15%
Graham Hill Road South Section	5,866	1.11	5%
Newell Creek Road Section	5,036	0.95	4%
Pipeline Road Section	18,418	3.49	15%
San Lorenzo Way Section	5,152	0.98	4%
Alternative Sections Subject to Preliminary Habitat Assessment	**50,707**	**9.60**	**42%**
Mount Hermon Rd Alternative Section	29,392	5.57	25%
Quail Hollow Rd Alternative Section	21,315	4.04	18%
All Sections	**119,780**	**22.69**	**100%**

As outlined in Table 3, the Proposed Project sections (Table 2) were subject to a Full Habitat Assessment, which assessed habitat for individual species; the Alternative Sections (Table 2) were subject to a

Preliminary Habitat Assessment, which entailed mapping the Sandhills ecosystem, but did not include differentiating the communities or assessing habitat for the special-status species (Table 3).

Table 3: Levels of Assessment Used to Evaluate Sandhills Systems

Assessment Level	Use	Description of Assessment
Full Habitat Assessment	Nine Proposed Project Pipeline Sections (Table 2)	Classified the Sandhills according to one of three main Sandhills community types, and assessed each mapped Sandhills patch according to suitability of the habitat for seven special-status species that inhabit the Sandhills.
Preliminary Habitat Assessment	Two Alternative Sections (Table 2)	Mapped areas featuring the Sandhills ecosystem; did not differentiate Sandhills communities nor assess habitat for special-status species

In areas subject to both the Full and Preliminary Habitat Assessment, Sandhills ecosystems were evaluated with respect to the following geographic areas:

1. **Pipeline Sections**: the nine Proposed Project sections, as well as the two Alternative Sections;
2. **Project Work Area**: the anticipated areas of work around the Proposed Project pipeline alignment, which includes the road right-of-way and adjacent work areas, including anticipated staging areas; and
3. **Survey Area*:*** the 1,618-acre area assessed for the project. For the Proposed Project sections, the Project Work Area was buffered by 300 feet (on either side) while the same buffer (300 feet) was used to develop the Proposed Project survey area. For the Alternative Sections, a 300-foot buffer was applied to the centerline of the two pipeline alignments, for which specific Project Work Areas have not been defined.

2.3 Assessment Methods

For this assessment, the Sandhills ecosystem was delineated within the 1,618-acre survey area associated with all 11 pipeline sections (Table 2), and Sandhills communities and special-status Sandhills species habitat were differentiated for the Proposed Project survey area, via two methods:

1. Review existing documents and spatial data; and
2. Conduct on-the-ground assessment.

2.3.1 Review Existing Documents and Spatial Data

First, a geographic information system featuring existing spatial data and high-resolution aerial imagery, was assembled and reviewed to identify known or likely locations of the Sandhills ecosystem, communities, and special-status species (Table 4).

Table 4: Spatial Data Used to Map the Sandhills Ecosystem, Communities, and Habitat for Special-Status Species

Layer and Source	Description	Use in the Project
Sandhills (McGraw 2005a)	Areas of Sandhills habitat mapped based on analysis of aerial imagery and ground truthing. Each patch is attributed according to the rare species observed in the patch	Identify known patches of the Sandhills ecosystem within the survey areas and note special-status species occurrences, where indicated at the appropriate spatial scale
Sand Parkland (McGraw 2005b)	Areas supporting sand parkland, which is an exceptionally rare and diverse Sandhills community that supports Zayante band-winged grasshopper and Ben Lomond wallflower	Evaluate occurrences of sand parkland habitat within the survey areas to assess potential for occupancy by special-status species
Zayante Soils (USDA 1980)	Soil mapping units classified as Zayante Coarse Sand and Zayante-Rock Outcrop Complex	Identify additional, potential patches of Sandhills ecosystem
California Natural Diversity Database (CDFW 2020)	Occurrences of four endangered species mapped within CNDDB: Mount Hermon June beetle, Zayante band-winged grasshopper, Ben Lomond spineflower, and Ben Lomond (Santa Cruz) wallflower	Identify known occurrences of the special-status species, which were used to indicate that the species have been 'observed' within the mapped patches of Sandhills ecosystem
Endangered Sandhills Species Data (J. McGraw unpublished data)	Additional mapped occurrences of rare Sandhills species based on prior surveys	Identify known occurrences of the special-status species, which were used to indicate that the species have been 'observed' within the mapped patches of the Sandhills ecosystem
Aerial Imagery (County of Santa Cruz 2016)	High-resolution (3"- pixel) aerial imagery of the Study Region	Identify Sandhills ecosystem and differentiate Sandhills communities based on the signature of two main indicators: silverleaf manzanita and ponderosa pine

In addition to the spatial data, a review was conducted of prior reports and plans assessing Sandhills, including the *Sandhills Conservation and Management Plan* (McGraw 2004b) and survey reports prepared for other conservation and land use projects in the region.

2.3.2 Conduct On-the-Ground Assessments

To further evaluate the occurrence of Sandhills systems in the Project Area, a visual assessment was conducted in the following areas where access was provided on the ground:

- County and City road rights-of-way (i.e., all public road ways)

- City of Santa Cruz properties and easements:
    - Graham Hill Water Treatment Plant located at 715 Graham Hill Road; and
    - The pipeline alignment itself, over which the SCWD has an easement that grants access;
- Public lands:
    - Henry Cowell Redwoods State Park; and
    - Pace Property (County of Santa Cruz Parks Department);
- Other lands open for access:
    - Mount Hermon Christian Conference Center; and
    - Roaring Camp Railroads.

For the Proposed Project sections, the on-the ground assessment entailed walking the pipeline alignment on foot, and entering the Proposed Project survey area where it was accessible and where needed to evaluate Sandhills biological systems. Specifically, on-the-ground assessment of the proposed pipeline area was used to delineate the Sandhills ecosystem and to aid classification and delimitation of the Sandhills communities. Where access was precluded, binoculars and aerial imagery were used to assess habitat conditions.

Observations were recorded for the special-status plants, including primarily the two perennial species which are conspicuous during the winter when the assessment was conducted, silverleaf manzanita and Ben Lomond buckwheat; however, the field assessment was not designed to constitute a focal-species survey or otherwise map the individual plants or other species. Separate focal-species surveys would need to be conducted during the appropriate season following a protocol designed to identify and map their areal extent individually, as needed.

For the Alternative Sections, the on-the-ground assessment primarily consisted of a windshield survey to check areas where the occurrence of Sandhills biological systems was uncertain following the review of existing spatial data.

2.4 Classification and Mapping Methods

The review of existing information and the on-the-ground assessment were used to delineate Sandhills ecosystems within the 1,618-acre survey area. Within the Proposed Project survey area, which was subject to the Full Habitat Assessment, Sandhills communities and habitat for special-status species were also mapped, as outlined below.

2.4.1 Sandhills Ecosystem

The Sandhills ecosystem was mapped to include areas that: 1) are known to include Sandhills biological systems based on direct observations, and 2) areas that are more likely than not to include Sandhills biological systems, based on available information. The Sandhills ecosystem was mapped based on the occurrence of one or both of the following:

1. **Sandhills Soils:** Zayante sand soil observed on the ground, and/or in soils mapping units (USDA 1980). Areas featuring soils that appeared transitional between Zayante soils and the loam soils

in the region were included in the mapping where they occurred adjacent to Zayante soils, as these areas can support special-status species of the Sandhills, including the Mount Hermon June beetle.

2. **Sandhills Indicator Species:** Direct observations and records of species that are indicators of the Sandhills ecosystem, including two dominant Sandhills species that, within Santa Cruz County, are found primarily in the Sandhills ecosystem supported by Zayante sand soil: ponderosa pine (*Pinus ponderosa*) and silverleaf manzanita (*Arctostaphylos silvicola*).

While Sandhills indicator species are helpful in mapping Sandhills ecosystems, their presence was not requisite; instead, Zayante soils alone were sufficient to include an area within the mapped Sandhills ecosystem. This is because Zayante soils can support special-status Sandhills species even where the dominant Sandhills plant species are absent, as a result of one or more of the following (Arnold 2004, McGraw 2004b, McGraw 2013, and McGraw and Jordan 2021):

1. land use modifications such as development, which can remove the dominant native Sandhills plants, but does not eliminate habitat for the special-status species;
2. succession, which can cause ponderosa pine and silverleaf manzanita to be (temporarily) absent; and
3. in areas with mesic conditions, including north-facing slopes, areas featuring greater soil moisture (i.e., wetlands and along streams), and/or areas featuring transitional soils (i.e., soils with characteristics intermediate between Zayante soils and loam soils), which are dominated by coast live oak (*Quercus agrifolia*), which is also found on loam soils in the region.

Because the intent of the assessment was to identify all Sandhills biological resources, there was no minimum mapping unit. Sandhills ecosystems were mapped irrespective of roads, buildings, and other features that can remove or degrade habitat for species; these features could be addressed in finer-scale mapping, as needed.

2.4.2 Sandhills Communities and Habitat Conditions

In the Proposed Project survey area, where the Full Habitat Assessment was conducted, areas within the Sandhills ecosystem were classified into one of three main community types (Table 5); the exception was at the Ben Lomond Transfer Station, where the Zayante soils were mapped as “landfill”.

Sandhills communities were not differentiated within the Alternative Sections survey area, which was instead subject to a Preliminary Habitat Assessment designed to identify the Sandhills ecosystem (Section 2.2).

The Sandhills community types used in this habitat assessment are not meant to provide a detailed resolution of the plant communities in the survey area and instead, they were used to aid determination of habitat for Sandhills species based on key differences in plant community structure and species composition (Table 5).

Table 5: Sandhills Community Types Classified within the Proposed Project Survey Area where the Sandhills ecosystem was Subject to a Full Habitat Assessment

Community	Description
Silverleaf manzanita chaparral	Areas domianted by shrubs including silverleaf manzanita, with scattered (relatively open canopy of) trees including ponderosa pine and coast live oak
Ponderosa pine forest	Forests featuring ponderosa pine and associated hardwoods including coast live oak, Pacific madrone (*Arbutus menziesii*), that feature emergent or even abundant Pacific Douglas-fir (*Pseudotsuga menziesii*) in areas of transitional soil or successional areas. These forest may feature silverleaf manzanita in the understory at low to moderate abundance.
Coast live oak woodland	Hardwood woodlands on Zayante soil that have limited (or no) ponderosa pine and silverleaf manzanita (though the latter are often senescent or dead in the understory). This community typically occurs in mesic microsites including north-facing slopes, areas along streams or near wetlands, and transitional soils, as well as long-unburned areas.

The Sandhills community patches were also assessed according to their condition using the categories outlined in Table 6. These categories were created to aid assessment of habitat for the seven species, some of which can be affected by land use modifications and succession or transitional conditions.

Table 6: Sandhills Community Conditions used to Aid Assessment of Species Habitat

Condition	Description
Intact/relatively intact	Sandhills communities that have only limited impacts from human activities and land uses and are dominated by species typical of the community
Modified by land use	Sandhills communities that have been altered by human land use activities, including development, sand mining, and road building. This condition was used to characterize residentially developed areas in the Sandhills.
Transitional/ successional	Sandhills communities that feature plant species composition and structure that is intermediate between typical Sandhills communities and non-Sandhills communities. Specifically, plant communities that have denser canopy cover and/or a higher percentage cover of plant species found on loam soils but not typically observed on Zayante soils. This can occur due to two non-mutually exclusive factors: • transitional soils: soils that are transitional between typical Zayante coarse sand soil and loam soils (i.e., due to different parent material, microclimate, hydrology, and vegetation development, among other factors); and • Succession: areas that have been long unburned, where species that predominate on loam soils, including Pacific Douglas-fir, have become established in the absence of fire. These transitional/successional communities often support Mount Hermon June beetle but currently lack other Sandhills special-status species presently, though they could reoccupy the areas following fire or other disturbances that open up habitat and reset successional processes (McGraw 2004b).

2.4.3 Species Habitat

For each of the seven species, the Sandhills community patches in the Proposed Project survey area were classified into one of five categories. An additional 'not assessed' category was used for the Alternative Sections survey area, where species habitat was not classified within the Sandhills ecosystem (Table 7). The "potential to occur" categories were applied to the plant community patches based on the plant species composition and structure and the habitat condition within the plant community patch; the 'potential to occur' categories may not apply to all areas within very heterogeneous habitat patches. The Mount Hermon June beetle is ubiquitous within the Sandhills Ecosystem, and also occurs on loam soils adjacent to Zayante soils; therefore, the 'Not Expected" category was not used for this species.

Table 7: Categories Used to Assess the Special-Status Species Potential to Occur

Category	Description
Observed	The species is known to utilize the Proposed Project survey area, based on prior records and/or observations made during the assessment.
High	The species is not known to occur in the Proposed Project survey area, but is likely to be present based on suitable habitat and/or occurrences in proximity.
Moderate	The species has an even probability of being present in the Proposed Project survey area as not.
Low	The species has a low probability of being in the Proposed Project survey area due to current low habitat suitability; in some cases, fire, succession, or other natural processes could increase habitat suitability.
Not Expected	The species is unlikely to be present in the Proposed Project survey area due to currently unsuitable habitat; in some cases, fire, succession, or other natural processes could render the habitat suitable for the species.
Not Assessed	Used for the Alternative Sections survey area only, where species habitat was not assessed.

3 Results

3.1 Sandhills Ecosystem

Within the total 1,618-acre Proposed Project survey area and Alternative Sections survey area, a total of 745 acres occur within the Sandhills ecosystem (Table 8, Figure 2). The Proposed Project Survey Area, which is centered on the Proposed Project Work Area, features 416 acres of the Sandhills ecosystem, which is concentrated in the Graham Hill Road North Section, with smaller areas of Sandhills ecosystems also found in the Glen Arbor Road, Newell Creek Road, Graham Hill Road South, and Pipeline Road sections (Table 8, Figure 2). The Alternative Sections survey area contain an additional 329 acres of the Sandhills ecosystem (Table 8, Figure 2). No areas underlain by Zayante soil were observed in the other Proposed Project survey areas along the Brackney (North and South), Felton Booster, and San Lorenzo Way sections (Table 2, Figure 2).

Table 8: Sandhills Ecosystem within the Survey Areas

Project Area	Acres[1]	Percentage[2]
Proposed Project Survey Area (Full Habitat Assessment)	**416**	**56%**
Glen Arbor Road	87	12%
Graham Hill Road North	238	32%
Graham Hill Road South	12	2%
Newell Creek Road	71	10%
Pipeline Road	9	1%
Brackney North	0	0%
Brackney South	0	0%
Felton Booster	0	0%
San Lorenzo Way	0	0%
Alternative Sections Survey Area (Preliminary Habitat Assessment)	**329**	**44%**
Mount Hermon Road	160	21%
Quail Hollow Road	169	23%
All Survey Areas	**745**	**100%**

[1] Numbers may not total correctly due to rounding error.
[2] Percentage of total acres of the Sandhills ecosystem mapped within the survey area

3.2 Sandhills Communities

The Proposed Project survey area features three main Sandhills communities, which were classified based on their structure and species composition and also characterized according to their conditions that can influences species habitat, including land use (Section 2.4.2; Tables 5 and 9, Figure 3).

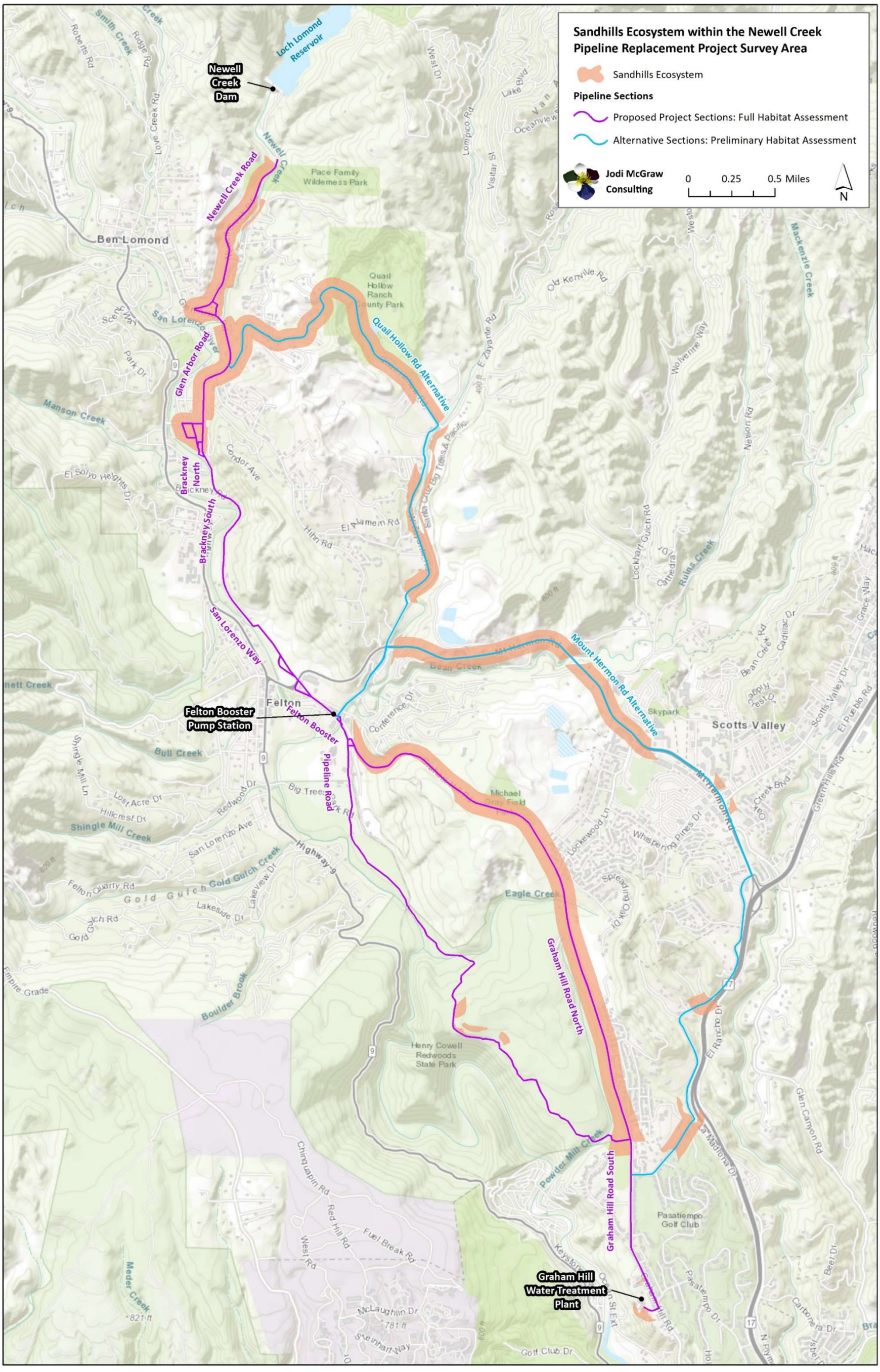


Figure 2: Sandhills Ecosystem within the Newell Creek Pipeline Replacement Project Survey Area

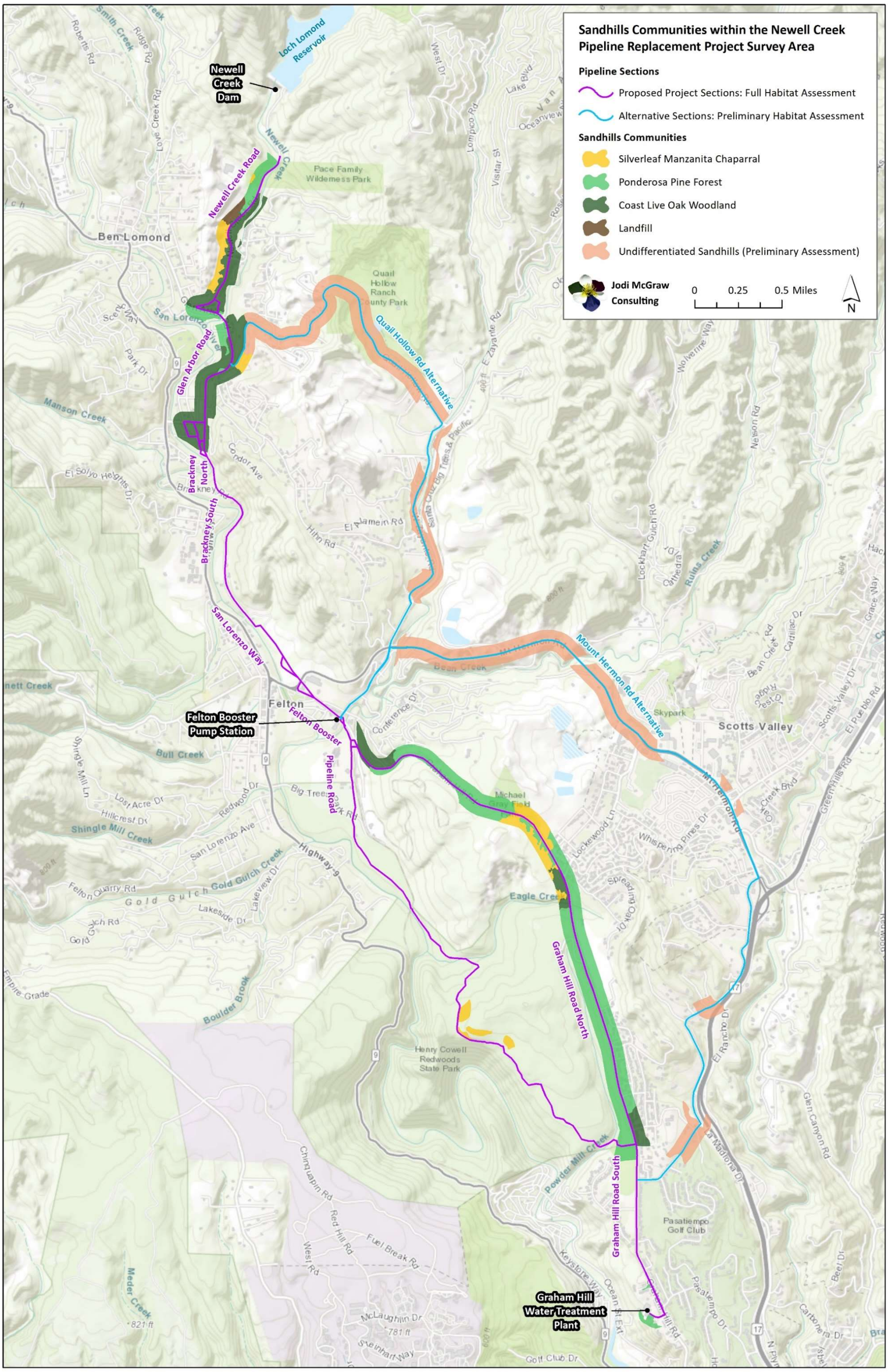


Figure 3: Sandhills Communities within the Newell Creek Pipeline Replacement Project Survey Area

Table 9: Sandhills Community Patches According to their Condition

	Acres in Sandhills Community Conditions (Table 6)[1]				
Sandhills Communities (Table 5)	**Intact/Relatively Intactly**	**Successional/ Transitional**	**Modified by Land Use**	**Mixed (Intact and Modified)**	**Total**
Proposed Project Survey Area	96	143	177		416
silverleaf manzanita chaparral	25	22			48
ponderosa pine forest	58	104	60		221
coast live oak woodland	13	16	113		142
landfill			5		5
Undifferentiated Sandhills Communities in the Alternative Sections Survey Area	160	13	136	20	329
All Sandhills Communities	**256**	**156**	**314**	**20**	**745**

[1] Numbers may not total correctly due to rounding error.

3.2.1 Silverleaf Manzanita Chaparral

3.2.1.1 Description and Occurrence in the Survey Area

A total of 48 acres within the Proposed Project survey area were classified as silverleaf manzanita chaparral (Table 9, Figure 3). This community is dominated by shrubs including silverleaf manzanita, buckbrush (*Ceanothus cuneatus* var. *cuneatus*), chamise (*Adenostoma fasciculatum*), and yerba santa (*Eriodictyon californicum*) and feature a relatively open canopy of trees including ponderosa pine and coast live oak. Canopy gaps within the silverleaf manzanita support subshrubs such as sticky monkeyflower (*Diplacus aurantiacus*) and herbs such as Ben Lomond spineflower, Santa Cruz monkeyflower (*Diplacus rattanii* ssp. *decurtatus*), and hollyleaf navarretia (*Navarretia atractyloides*; McGraw 2004b).

Within the Proposed Project survey area, silverleaf manzanita chaparral occurs in four main locations: atop Mount Hermon in the Graham Hill Road North Section, near the intersection of Glen Arbor Road and Quail Hollow Road in the Glen Arbor Road Section, in the western portion of the Newell Creek Road Section south of the landfill, and in small patches near the center of Pipeline Road section (Figure 3). Though the sandhills plant communities were not differentiated or mapped as part of the Preliminary Habitat Assessment conducted within the Alterative Sections survey area, silverleaf manzanita chaparral occurs within the survey areas for both the Quail Hollow Road and Mount Hermon Road Alternative Sections (J. McGraw, pers. obs. 2021).

3.2.1.2 Condition

Of the total 48 acres of silverleaf manzanita chaparral within the Proposed Project survey area, 22 acres (47%) where characterized as successional, as the shrubs occurred in areas that are long-unburned

where tree canopy is greater; in the absence of fire, these areas may succeed to ponderosa pine forest or coast live oak (McGraw 2004b).

3.2.1.3 Status

Silverleaf manzanita chaparral is a Provisional Alliance in the Manual of California Vegetation (37.320.00; Sawyer et al. 2021). The community has a global rank of G1 and a state rank of S1.2 reflecting the extremely limited distribution (Sawyer et al. 2021); as a result, it meets the criteria for a sensitive plant community (CDFW 2009, CDFW 2020). Silverleaf manzanita chaparral is a type of maritime chaparral, which is a designated sensitive habitat by the County of Santa Cruz (1994).

3.2.2 Ponderosa Pine Forest

3.2.2.1 Description and Occurrence in the Survey Area

Within the Proposed Pipeline survey area, most of the Sandhills habitat (221 acres or 53% of the total) was classified as ponderosa pine forest (Table 9, Figure 3). These forests feature ponderosa pine and associated hardwoods including primarily coast live oak and Pacific madrone in the overstory; the understory consists of primarily shade-tolerant shrubs, vines, and ferns including coffee berry (*Frangula* californica), poison oak (*Toxicodendron diversilobum*), California blackberry (*Rubus ursinus*), and bracken fern (*Pteridium aquilinum* var. *pubescens*). Canopy gaps often feature shrubs and herbs found in the silverleaf manzanita chaparral (McGraw 2004b).

Within the Proposed Project survey area, most of the Sandhills ponderosa pine forest occurs along the Graham Hill Road sections (North and South), with smaller patches occurring in the survey areas along the Newell Creek Road and Glen Arbor Road sections (Figure 3). Though the sandhills plant communities were not differentiated or mapped as part of the Preliminary Habitat Assessment, ponderosa pine forest occurs within the survey areas for both the Quail Hollow Road and Mount Hermon Road Alternative Sections (J. McGraw, pers. obs. 2021).

3.2.2.2 Condition

Approximately 60 acres (27%) of the ponderosa pine forest in the Proposed Project survey area features land uses including residential development, that can degrade the quality of the habitat. Nonetheless, such partially-developed areas can support Sandhills special-status species, including the Mount Hermon June beetle (USFWS et al. 2011).

Nearly half of the ponderosa pine forest (104 acres or 47%) in the Proposed Project survey area supports relatively high cover of Pacific Douglas-fir and hardwoods and low abundance of ponderosa pine, most of which are mature. These forests occur on soils that are transitional between Zayante coarse sand soil and loam soils, in areas with otherwise more mesic soil conditions including near streams or north-facing slopes, and/or in areas that have been long unburned. These transitional soils and successional conditions allow for establishment of trees such as Pacific Douglas-fir and growth of hardwoods that outcompete ponderosa pine for light and limit its establishment (McGraw 2004b).

Due to the low density of ponderosa pine, these transitional/successional ponderosa pine forests would not be classified as ponderosa pine forest in a general plant community classification, including one

conducted based on the *Manual of California Vegetation* (Sawyer et al. 2021). However, they were classified as ponderosa pine forest for purposes of this Sandhills assessment as, unlike the forests dominated by oaks and Pacific Douglas-fir that occur on loam soils, these forests on Zayante sand soil can support populations of the Mount Hermon June beetle and perhaps also silverleaf manzanita in the understory, which are often senescent due to long fire-free period.

3.2.2.3 Status

The coastal, low-elevation ponderosa pine forests in the Sandhills have not been previously characterized or classified in the *Manual of California Vegetation* (MCV; Sawyer et al. 2021), which instead describes ponderosa pine forests from analysis of their structure and species composition further inland and/or at higher elevation. For these reasons, Sandhills stands do not fit the classification criteria for 'ponderosa pine forest' under the MCV, which requires 50% relative cover of ponderosa pine; Sandhills stands are typically not densely stocked with ponderosa pine and instead co-dominate with hardwoods. Sandhills plant communities are currently being analyzed as part of a project to classify and map plant communities in the Santa Cruz Mountains (J. Evens, pers. comm. 2020). Future versions of the MCV are anticipated to include Sandhills ponderosa pine forests and other Sandhills communities. Like silverleaf manzanita chaparral, these currently undescribed Sandhills communities are anticipated to be recognized as sensitive communities due to their limited geographic range.

All Sandhills ecosystems defined as areas of Zayante sand soil in central Santa Cruz County are currently considered "Sensitive Habitat" under the County of Santa Cruz Sensitive Habitat Ordinance as they provide habitat for rare and endangered species. Additionally, the County recognizes Indigenous ponderosa pine as a Sensitive Habitat as well as Special Forest (County of Santa Cruz 1994).

3.2.3 Coast Live Oak

3.2.3.1 Description and Occurrence in the Survey Area

The Proposed Project survey area features a total of 142 acres of woodlands on Zayante soil that are dominated by coast live oak and feature primarily shade-tolerant vines and herbs in the understory (Table 9, Figure 3). Unlike the ponderosa pine forests, these Sandhills coast live oak woodlands have limited (or no) ponderosa pine and, due to the dense canopy, they also have limited silverleaf manzanita, though senescent or dead shrubs canopy occur in the understory. Sandhills coast live oak woodland typically occurs in mesic microsites including north-facing slopes, areas along streams or near wetlands, and on transitional soils; they may also be preferentially found in areas that are long unburned. These coast live oak woodlands feature different plant species composition than the more widespread coast live oak woodlands on loam soils in the region; they also support rare Sandhills species such as the Mount Hermon June beetle (Section 3.3.2.1).

The Sandhills coast live oak woodlands are concentrated along the Newell Creek Road and Glen Arbor Road sections, though also occur patchily along Graham Hill Road (North and South sections; Figure 3). The survey area along both the Quail Hollow Road and Mount Hermon Road alternative sections also features Sandhills coast live oak woodlands (J. McGraw, pers. obs. 2021)

3.2.3.2 Condition

Of the 142 acres of Sandhills coast live oak woodland in the Proposed Project survey area, 16 acres (11%) were characterized as successional/transitional, as they occur at the ecotone between the Sandhills and riparian communities along Newell Creek and along the San Lorenzo River.
An additional 113 acres (80%) of the coast live oak woodland is modified by land use activities, which principally include residential development. In areas of relatively high-density residential development, as occur along the Newell Creek Road and Glen Arbor Road sections of the Proposed Project , some of these mapped Sandhills coast live oak woodlands feature scattered remnant coast live oak in a matrix of buildings, hardscapes, and ornamental landscapes. As with the ponderosa pine forests modified by development, these areas in the Sandhills can continue to support rare Sandhills species, including most notably, Mount Hermon June beetle (USFWS et al. 2011).

3.2.3.3 Status

Like the Sandhills ponderosa pine forests, coast live oak woodlands in the Sandhills have not been previously characterized or classified in the *Manual of California Vegetation* (Sawyer et al. 2021). The Sandhills plant communities are currently being analyzed as part of a project to classify and map plant communities in the Santa Cruz Mountains (J. Evens, pers. comm. 2020). Future versions of the MCV are anticipated to include Sandhills coast live oak woodlands and other Sandhills communities that are currently omitted. Like silverleaf manzanita chaparral, these undescribed communities are anticipated to be recognized as sensitive communities due to their limited geographic range. As noted above, All Sandhills ecosystems defined as areas of Zayante sand soil in central Santa Cruz County are currently considered “Sensitive Habitat” under the County of Santa Cruz Sensitive Habitat Ordinance as they provide habitat for rare and endangered species.

3.2.3.4 Undifferentiated Sandhills Communities

The Alternative Sections survey area contains a total of 329 acres of Sandhills ecosystem that was not mapped according to the community type (Table 9, Figure 3). These undifferentiated Sandhills communities include the three communities within survey area for the Proposed Project, which occur in various conditions including with varying degrees of prior land use modifications. The survey area along Quail Hollow Road and Mount Hermon Road Alternative Sections also includes sand parkland—an exceptionally rare Sandhills community type characterized by an open canopy of ponderosa pine with a diverse understory of herbaceous plants and subshrubs, which provides habitat for the Zayante band-winged grasshopper as well as the Mount Hermon June beetle and the three herbaceous Sandhills endemic plants (Table 1; Marangio and Morgan 1987, McGraw 2004b).

3.3 Sandhills Species Habitat

Five of the seven Sandhills special-status species evaluated in this assessment have been observed within the Proposed Project survey area (Table 10, Figures 4-10). The other two species, Ben Lomond wallflower and Zayante band-winged grasshopper, have moderate potential to occur within open silverleaf manzanita chaparral in a relatively small portion (11 and 16 acres, respectively) of the survey area along the Newell Creek Road Section (Table 10, Figures 4-10). In addition, Zayante band-winged grasshopper has moderate potential to occur in a 2-acre area of recently burned Sandhills within the survey area along the Pipeline Road Section (Figure 9).

Table 11 identifies the potential for the special-status Sandhills species to occur in the Alternative Sections survey area, where species habitat was not individually mapped (Section 2.2). The Quail Hollow Road and Mount Hermon Road sections feature Sandhills habitat in which all Sandhills special-status species have been observed *except* for the Santa Cruz kangaroo rat, which has moderate and high potential, respectively, to occur in the Mount Hermon Road and Quail Hollow Road Alternative Sections.

Table 10: Species Habitat within the Areas Mapped in the Sandhills Ecosystem within the Survey Areas

	Habitat Assessment Categories (Acres)[1]						
Habitat	Observed	High	Moderate	Low	Not Expected	Not Assessed	Total
Mount Hermon June beetle	112	140	122	42		329	745
Zayante band-winged grasshopper			20	33	367	329	745
Santa Cruz Kangaroo rat	28	31	32	54	270	329	745
Ben Lomond spineflower	25	14	49	160	168	329	745
Ben Lomond wallflower			11	46	360	329	745
Ben Lomond buckwheat	25	10	49	190	142	329	745
Silverleaf manzanita	113		61	157	85	329	745

[1] **Species habitat assessment categories. Note that numbers may not sum due to rounding error.**

Observed: The species is known to utilize the area, based on prior records and/or observations made during the assessment.

High: The species is not known to occur in the area, but is likely to be present based on suitable habitat and/or occurrences in proximity.

Moderate: The species has an even probability of being present in the area as not

Low: The species has a low probability of being in the area due to current low habitat suitability; in some cases, fire, succession, or other natural processes could increase habitat suitability.

Not Expected: The species is unlikely to be present in the area due to currently unsuitable habitat; in some cases, fire, succession, or other natural processes could render the habitat more suitable.

Not Assessed: Area within the Alternative Sections survey area, which was subject only to a preliminary Sandhills assessment, during which individual species habitat was not assessed.

Table 11: Assessment of Species Habitat within the Alternative Sections Survey Areas

	Alternative Sections	
Species	Mount Hermon Rd	Quail Hollow Rd
Mount Hermon June beetle	Observed	Observed
Zayante band-winged grasshopper	Observed	Observed
Santa Cruz Kangaroo rat	Moderate	High
Ben Lomond spineflower	Observed	Observed
Ben Lomond wallflower	Observed	Observed
Ben Lomond buckwheat	Observed	Observed
Silverleaf manzanita	Observed	Observed

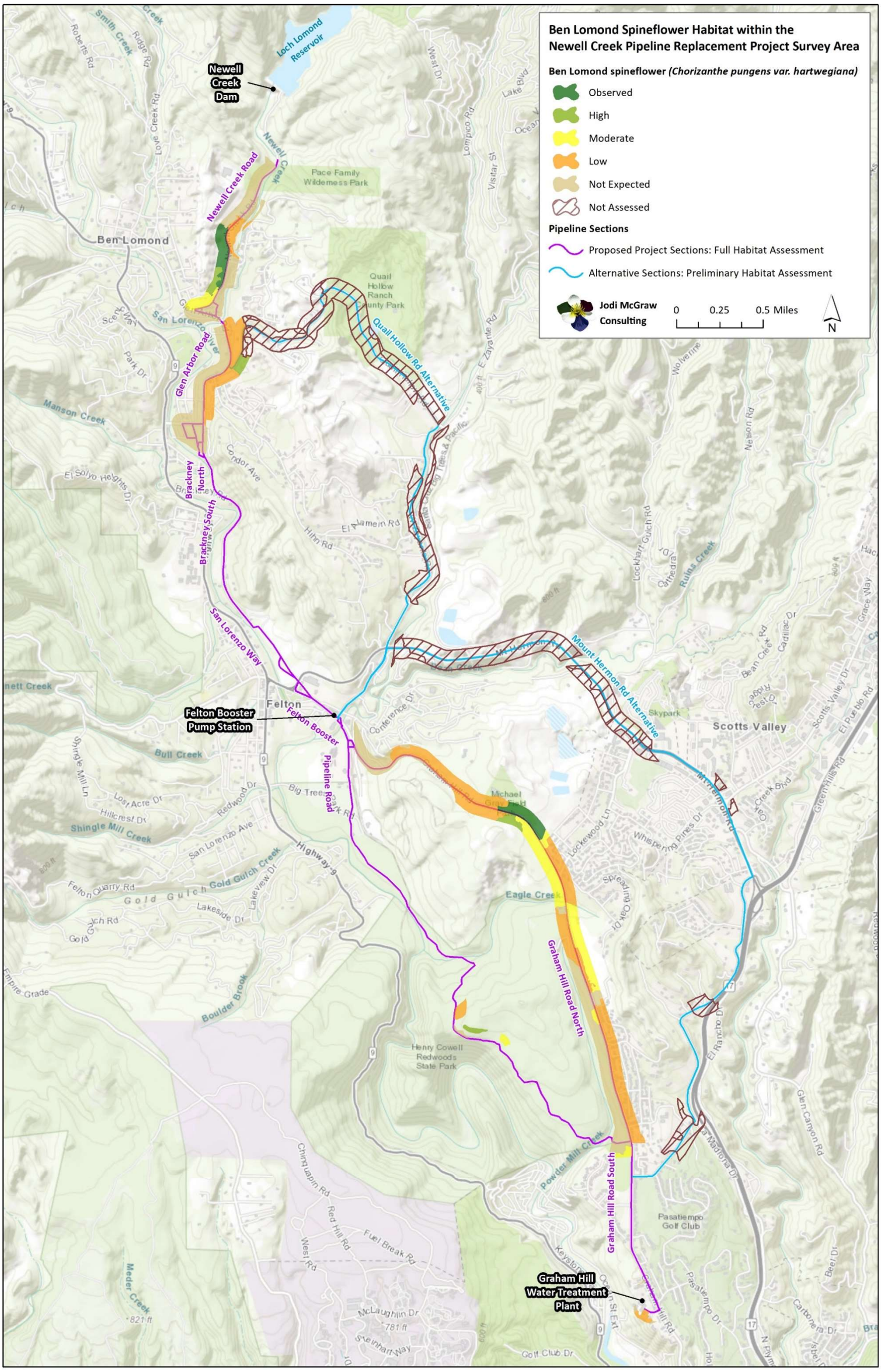


Figure 4: Ben Lomond Spineflower Habitat within the Proposed Project Survey Area

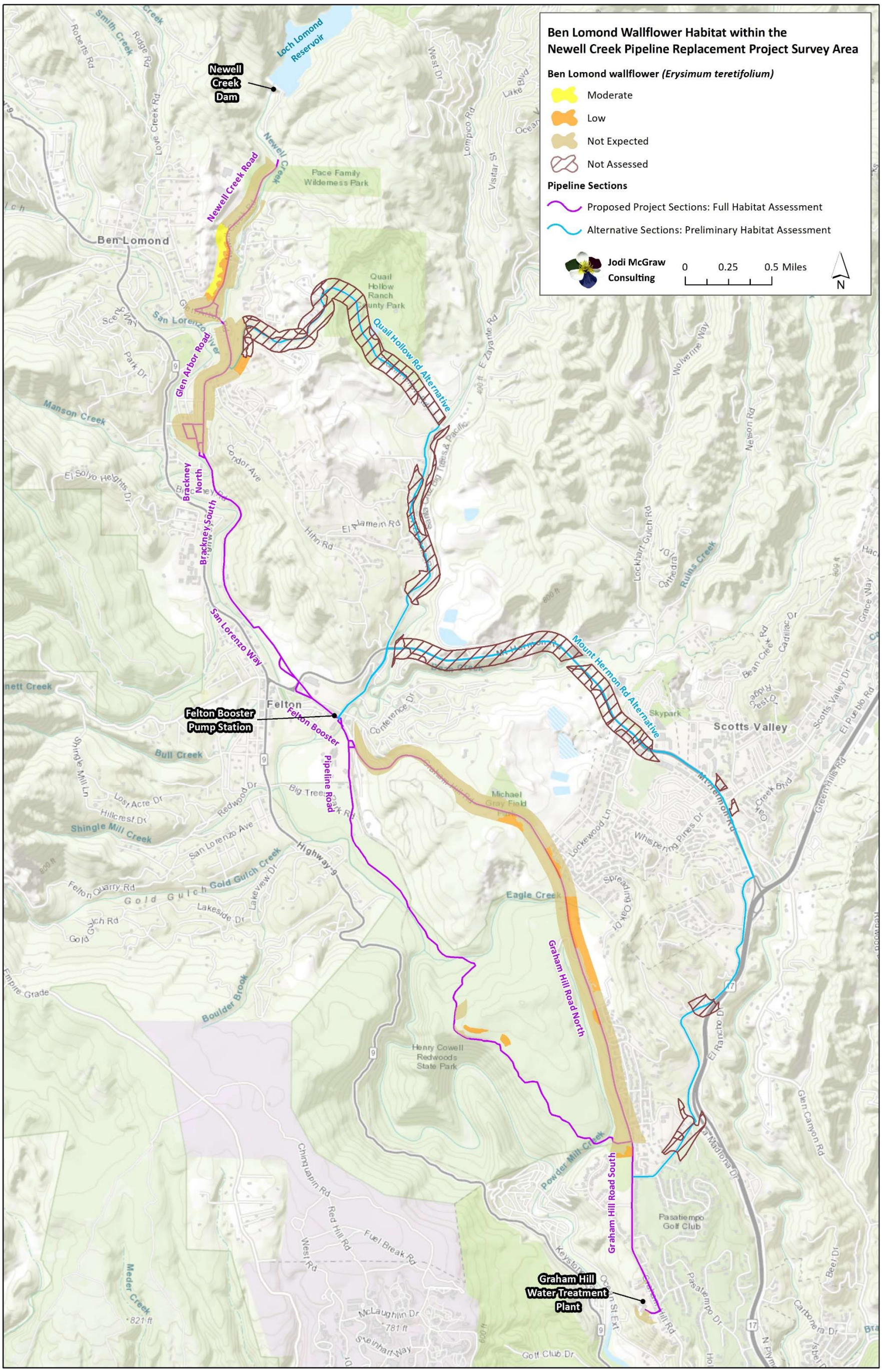


Figure 5: Ben Lomond Wallflower Habitat within the Proposed Project Survey Area

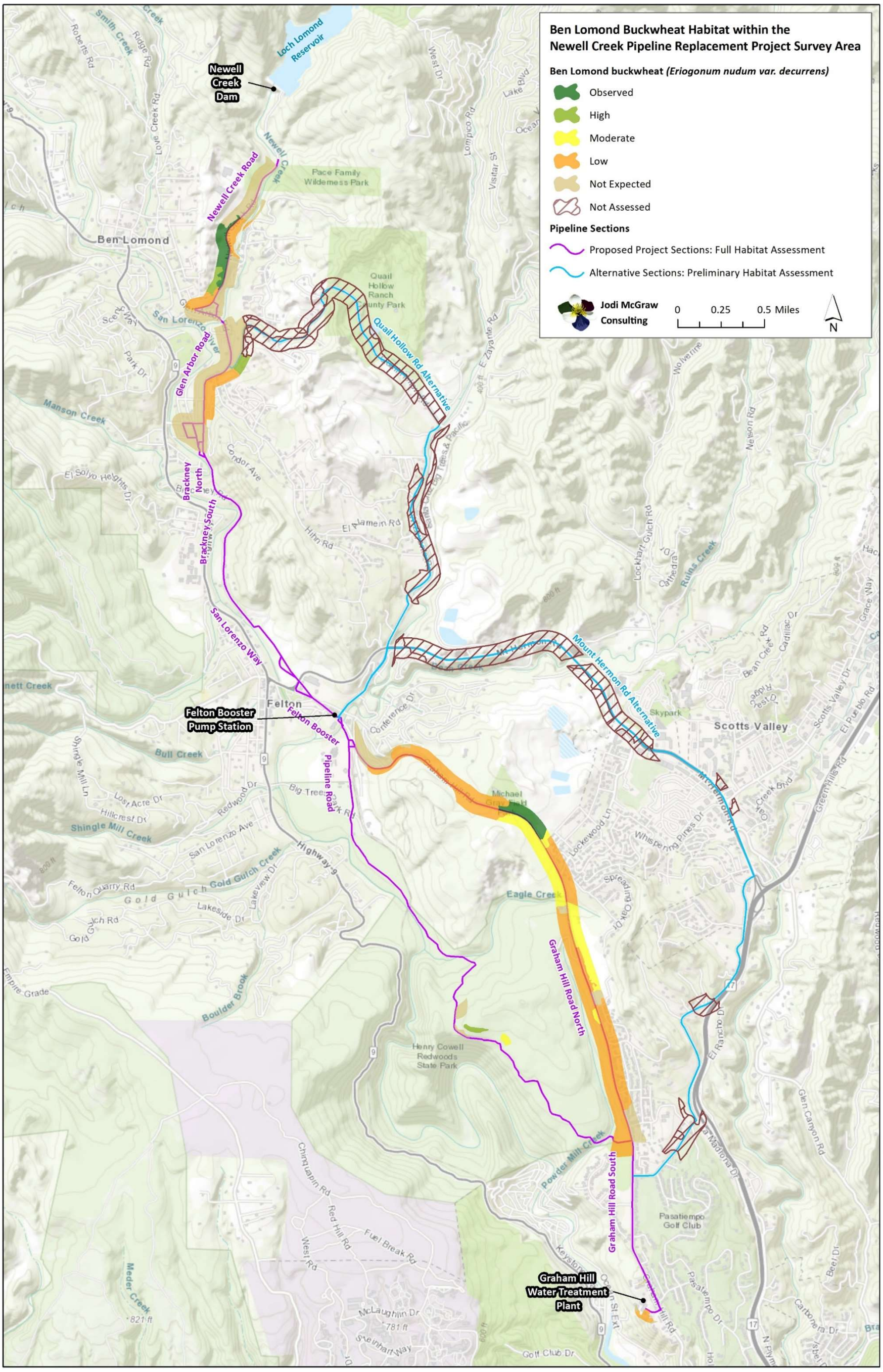


Figure 6: Ben Lomond Buckwheat Habitat within the Proposed Project Survey Area

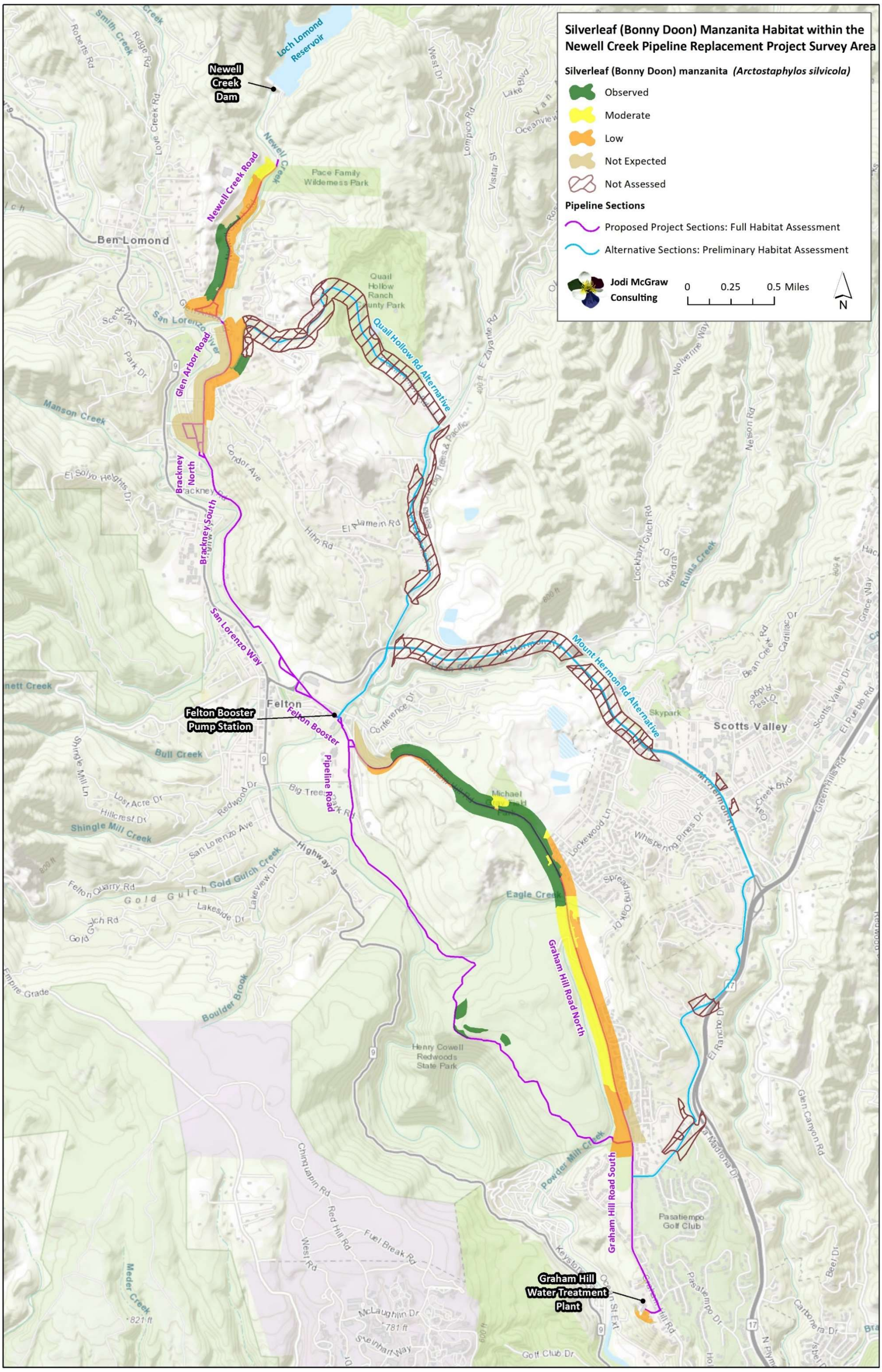


Figure 7: Silverleaf (Bonny Doon) Manzanita Habitat within the Proposed Project Survey Area

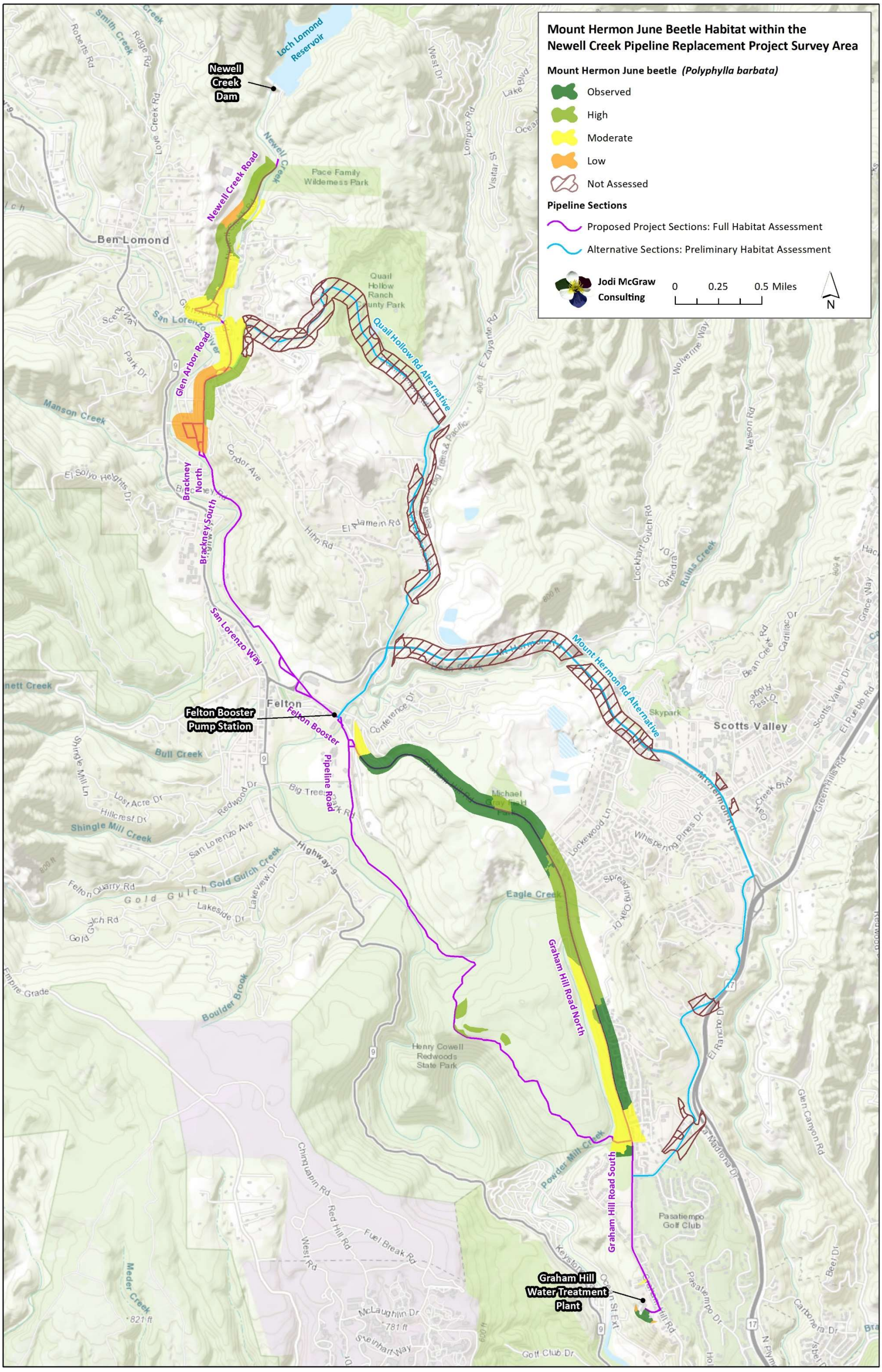


Figure 8: Mount Hermon June Beetle Habitat within the Proposed Project Survey Area

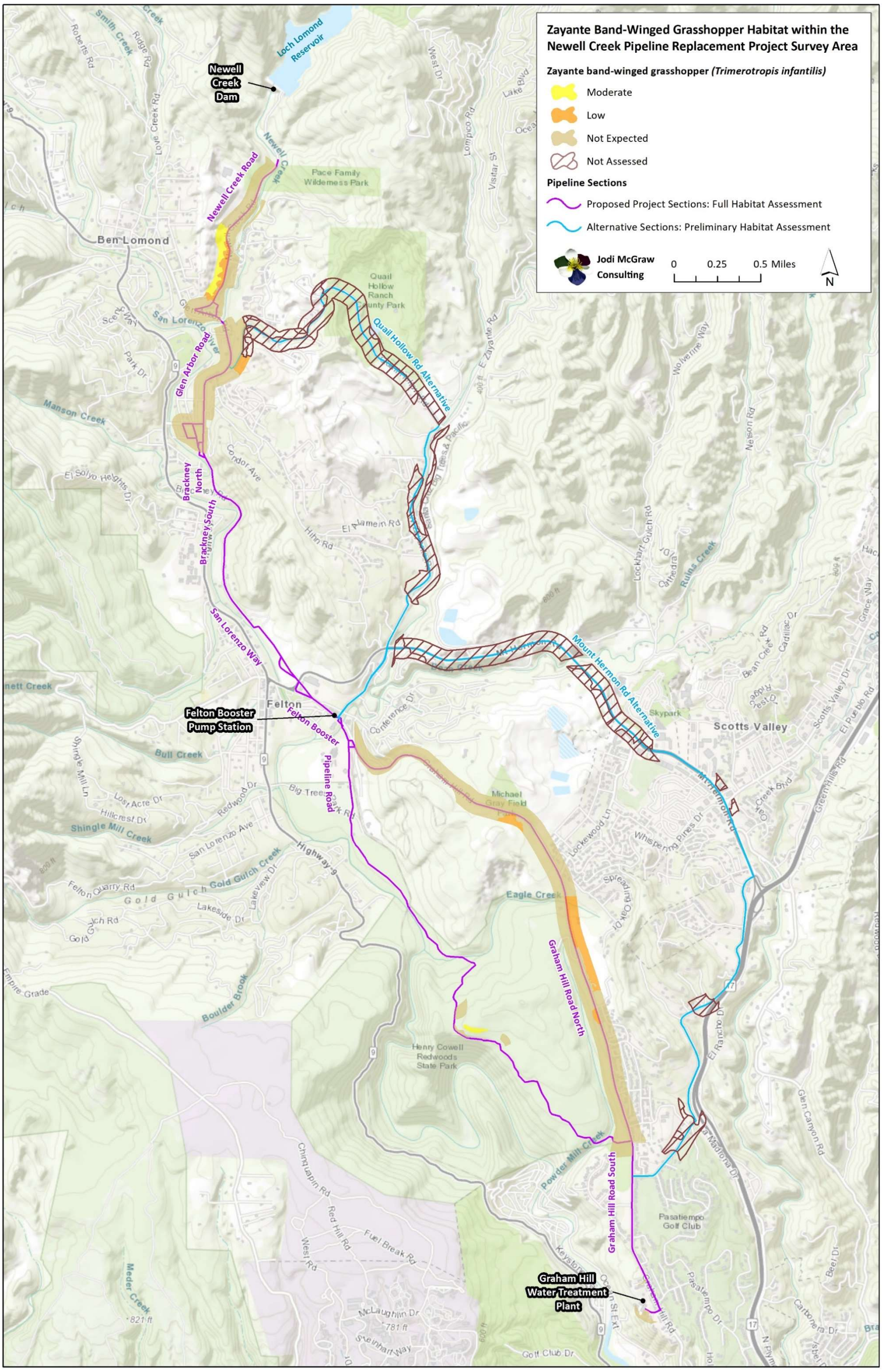


Figure 9: Zayante Band-Winged Grasshopper Habitat within the Proposed Project Survey Area

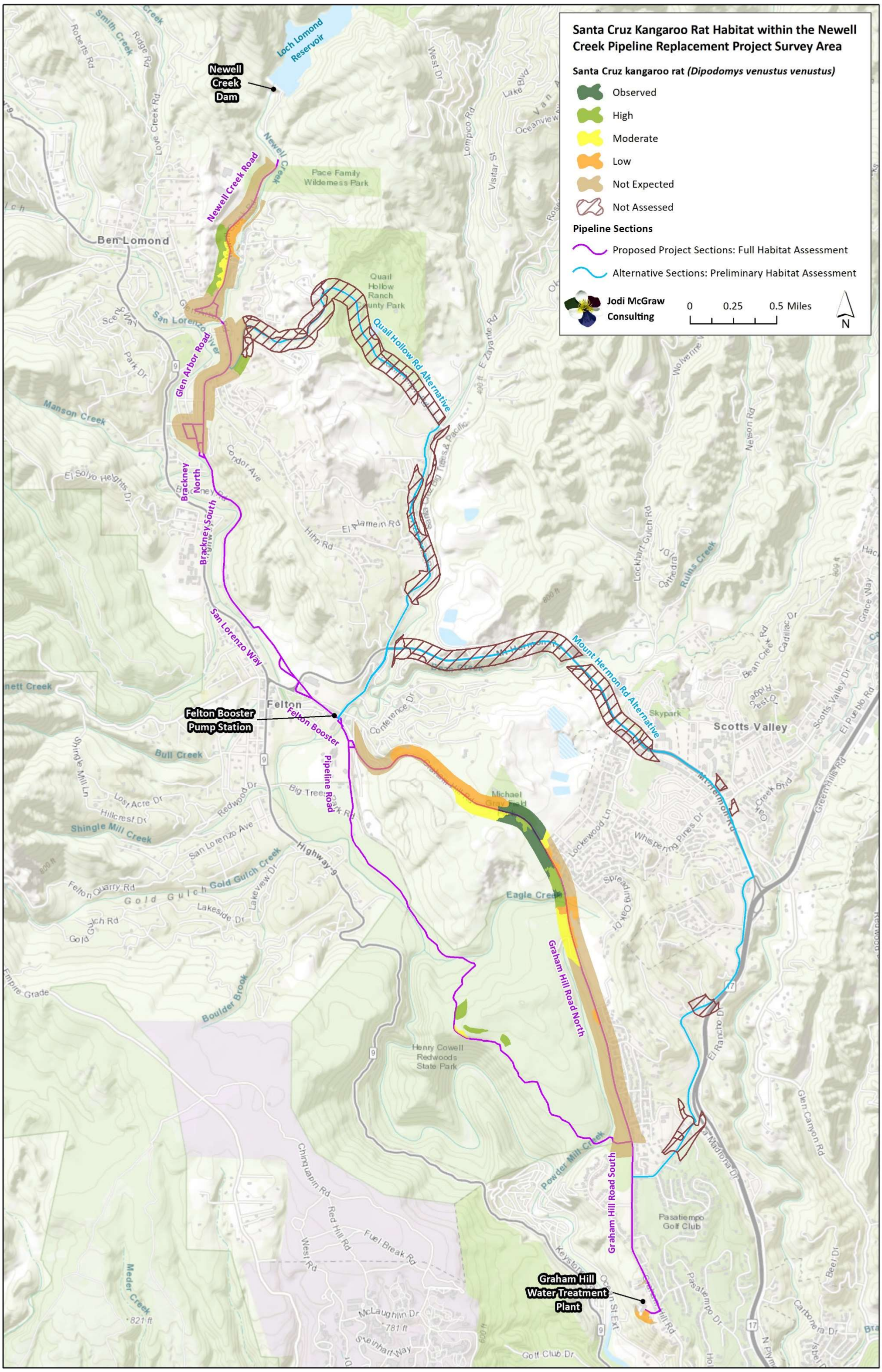


Figure 10: Santa Cruz Kangaroo Rat Habitat within the Proposed Project Survey Area

The following sections briefly describes the species and the occurrence of their habitat within the Proposed Project survey area, which is illustrated in Figures 4-10. It also briefly discusses their occurrence in the Alternative Sections survey area.

3.3.1 Plants

3.3.1.1 Ben Lomond Spineflower

3.3.1.1.1 Description and Status

Ben Lomond spineflower is a small annual herb of the buckwheat family (Polygonaceae). The species is endemic to the Sandhills where it primarily inhabits open, sparsely vegetated areas (McGraw and Levin 1998, McGraw 2004a,b) in sand parkland and gaps within the Sandhills chaparral, though can also be found at low abundance around the edges of trees or in canopy gaps in Sandhills woodlands and forests (McGraw 2004b, McGraw 2015). The disturbance-adapted species preferentially occurs in areas of natural disturbance, including slides, trails, and on gopher mounds, which maintain open canopy and soil conditions it requires (McGraw 2004a). As a result of its adaptation to disturbance, Ben Lomond spineflower also inhabits areas that have been modified by prior land use, including sand mines, residentially developed areas, and road turn outs (McGraw 2004b, USFWS et al. 2011). The Ben Lomond spineflower was listed as federally endangered on February 4, 1994 (USFWS 1994), Critical habitat has not been designated for the species, which has a California Rare Plant Rank of 1B.1 reflecting that the species is seriously threatened, with over 80% of occurrences are threatened (CNPS 2021).

3.3.1.1.2 Habitat in the Survey Area

Ben Lomond spineflower has been observed in the silverleaf manzanita chaparral and ponderosa pine forest in the Newell Creek Road Section and Graham Hill Road North Section, respectively (CDFW 2020, McGraw and Chrislock 2020, J. McGraw, pers. obs. 2021, Figure 4). The species is also known to occur in the Quail Hollow Road and Mount Hermon Road Alternative Sections. The rare annual has high potential to occur within patches of open habitat observed in the survey areas for the Glen Arbor Road and Pipeline Road sections but only moderate potential in the Graham Hill Road South Section survey area (Tables 10 and 11).

Because of its adaptation to disturbance, Ben Lomond spineflower has the potential to occur within the Proposed Project Work Area, including road turn outs in the road right-of-way that could be used for vehicle equipment and staging. A focal species survey would need to be conducted during the flowering season (April-June) to evaluate the species' occurrence within the Proposed Project Work Area.

3.3.1.2 Ben Lomond (Santa Cruz) Wallflower

3.3.1.2.1 Description and Status

A member of the mustard family (Brassicaceae), Ben Lomond wallflower is a biennial to short-lived perennial herb that forms a basal rosette of long, linear leaves. After two to three (rarely four) years, plants bolt and produce dense, terminal spikes (racemes) of four-petaled, yellow flowers; Ben Lomond wallflower fruits are long, slender capsules.

Endemic to the Sandhills, Ben Lomond wallflower is restricted to sandy soils of the Zayante series where the species primarily occurs in sand parkland, though it also inhabits sand chaparral gap associations adjacent to sand parkland and canopy gaps in Sandhills woodlands and forests (McGraw 2004a,b, McGraw 2015). Within these open canopy areas, Ben Lomond wallflower primarily occurs on recently or chronically disturbed areas, such as slides and along trail corridors (McGraw 2004a,b). While it can inhabit previously mined areas and cut slopes along road ways, the species is not frequently observed in residentially developed areas (USFWS et al. 2011).

Ben Lomond wallflower was listed as federally endangered on February 4, 1994 (USFWS 1994). Critical habitat has not been designated for the Ben Lomond wallflower, which has a California Rare Plant Rank of 1B.1 reflecting that the species is seriously threatened, with over 80% of occurrences are threatened (CNPS 2021).

3.3.1.2.2 Habitat in the Survey Area

Ben Lomond wallflower has not been previously observed in Proposed Project survey area, though it has moderate potential to occur in open habitat west of Newell Creek Road including the road cuts in the right-of-way (Table 10, Figure 5). The species has low potential to occur in open habitat within the Glen Arbor Road, Graham Hill Road (North and South), and Pipeline Road sections of the Proposed Project survey area (Table 10). Ben Lomond wallflower is known to inhabit the sand parkland, sand chaparral gaps, and cut slopes within the survey areas for the Quail Hollow and Mount Hermon Road Alternative Sections (Table 11).

Like Ben Lomond spineflower, Ben Lomond wallflower has the potential to occur in areas of open sand soil within the Proposed Project Work Area. The biennial/short-lived perennial is less commonly observed than the annual Ben Lomond spineflower in areas that are chronically disturbed, such as road turn outs, as too-frequent disturbance precludes reproduction; however, there is some limited potential for the species to be present in road cuts or other less frequently disturbed but open sand soil areas in the Proposed Project Work Area. A focal species survey would need to be conducted during the flowering season (April-June) to evaluate the species' occurrence within the Proposed Project Work Area.

3.3.1.3 Ben Lomond Buckwheat

3.3.1.3.1 Description and Status

Ben Lomond buckwheat (*Eriogonum nudum* var. *decurrens*) is a perennial herb or suffrutescent (subshrub) in the buckwheat family (Polygonaceae). Within the Sandhills, Ben Lomond buckwheat is found in both the sand parkland and canopy gaps in Sandhills chaparral (McGraw 2004b, McGraw 2015). In sand parkland, Ben Lomond buckwheat is preferentially found near the canopy edge but also occurs in open areas away from woody vegetation as well as underneath the canopy of ponderosa pines, which may increase soil moisture and reduce desiccation stress and thus facilitate survivorship of the perennial plant through the hot dry summers (McGraw 2004a,b).

Endemic to the Sandhills, the species has a California Rare Plant Rank of 1B.1, which reflects its serious endangerment resulting from its geographic range, habitat specificity, and multiple threats to remaining populations (CNPS 2021).

3.3.1.3.2 Habitat in the Survey Area

Ben Lomond buckwheat has been observed in the silverleaf manzanita chaparral along the Newell Creek Road Section and in the ponderosa pine forest along the Graham Hill Road North Section of the Proposed Project survey area (J. McGraw, pers. obs. 2021, Figure 5). The species also is known to occur in the survey areas for the Quail Hollow Road and Mount Hermon Road Alternative Sections. The rare annual has high potential to occur within patches of open habitat observed in the survey areas for the Glen Arbor Road and Pipeline Road sections, but only moderate potential in the survey area for the Graham Hill Road South Section (Tables 10 and 11, Figure 6).

Ben Lomond buckwheat was observed on road cuts and in road turn outs within and immediately adjacent to the Proposed Project Work Area within the Newell Creek Road and Graham Hill Road North sections (J. McGraw, pers. obs. 2021); the species has the potential to occur in similar open sandy habitat in the road right-of-way that could be used for vehicle equipment and staging. A focal species survey would need to be conducted, ideally during the species' flowering season (June - August), to fully evaluate its occurrence within the Proposed Project Work Area.

3.3.1.4 Silverleaf (Bonny Doon) Manzanita

Silverleaf manzanita is a large, evergreen shrub (1-6 m) in the heath family (Ericaceae), which is named for the grey-green color of its leaves. Silverleaf manzanita is one of the dominant species in the Sandhills, and a key indicator of the Sandhills ecosystem (Sections 2.4.1 and 2.4.2). Within the Sandhills, the species primarily occurs in Sandhills chaparral communities, including silverleaf manzanita chaparral; it also occurs at lower density in the mixed sand chaparral, which also supports crinite manzanita (*Arctostaphylos crustacea* spp. *crinita*), buck brush, chamise, yerba santa, and other chaparral shrubs (McGraw 2004b). As Sandhills chaparral communities are successional in the absence of fire (McGraw 2004b), silverleaf manzanita can be found at lower abundance in the understory of ponderosa pine forest, coast live woodland, and other forests and woodlands on Zayante sand soil, particularly in areas that are long unburned.

Endemic to the Sandhills, silverleaf manzanita has a California Rare Plant Rank of 1B.2, which reflects its fairly endangered as a result of its geographic range, habitat specificity, and multiple threats to remaining populations (CNPS 2021).

3.3.1.4.1 Habitat in the Survey Area

Silverleaf manzanita, which is a large conspicuous shrub that can be detected from aerial imagery, was observed as part of this study in all sections of the Proposed Project survey area featuring the Sandhills ecosystem, except Graham Hill Road South (Table 10, Figure 7); the species also was observed in the survey area for both Alternative Sections (Table 11).

Silverleaf manzanita grows in and adjacent to the Proposed Project Work Area, including in the road right-of-way. A focal species survey can be implemented to examine its specific distribution within the Project Work Area any time of the year.

3.3.2 Animals

3.3.2.1 Mount Hermon June Beetle

3.3.2.1.1 Description and Status

Mount Hermon June beetle is a member of the family Scarabaeidae (Insecta: Coleoptera) that occurs primarily in Sandhills communities on Zayante sand soil in central Santa Cruz County; the species has also been observed on sandy loam and loamy sand soils adjacent to Zayante soils (USFWS et al. 2011). Mount Hermon June beetle occurs in all Sandhills communities of varying successional stages, including ponderosa pine forest, silverleaf manzanita chaparral and other Sandhills chaparral, and Sandhills coast live oak woodlands as well as other Sandhills woodlands and forests, and sand parkland (McGraw and Jordan 2021). The endangered beetle has also been observed in areas where native Sandhills plant species have been removed, including those that are disturbed through development and that feature primarily ornamental or other non-native plant species (Arnold 2004).

Mount Hermon June beetle is univoltine (i.e., has only one generation per year) and largely fossorial. Larvae feed on roots of a variety of plants, as well as mycorrhizae (Hill and O'Malley 2009). They have been observed at depths of up to 2 meters and have been encountered beneath pavement (McGraw and Chrislock 2019). Adult males emerge from the soil at night between May and September to fly in search of mates. The Mount Hermon June beetle was listed as federally endangered on January 24, 1997 (USFWS 1997). Critical habitat has not been designated for this species.

3.3.2.1.2 Habitat in the Survey Area

Mount Hermon June beetle has been observed in the Proposed Project survey area along the Graham Hill Road North and Graham Hill Road South sections (CDFW 2020). The other sections of the Proposed Project, Glen Arbor Road, Newell Creek Road, and Pipeline Road, also traverse Sandhills habitat that is highly suitable for the species (Table 10, Figure 8). The Mount Hermon June beetle has also been observed along two Alternative Sections, Mount Hermon Road and Quail Hollow Road (Table 11; USFWS et al. 2011, CDFW 2020, McGraw 2021). Overall, Mount Hermon June beetle is likely to occur in portions of the Proposed Project Work Area that feature Zayante sand soil, including areas of transitional soils; the endangered beetle also has potential to occur on adjacent sandy loam and sandy loam soil. Within these soil types, the species can occur in all plant communities and other land cover types, including developed and disturbed areas, as well as paved areas.

3.3.2.2 Zayante Band-Winged Grasshopper

3.3.2.2.1 Description and Status

Zayante band-winged grasshopper is a member of the family Acrididae (Insecta: Orthoptera). The species is endemic to the Sandhills, where it occurs in open, sunlit areas that are sparsely vegetated (Arnold 2004). Zayante band-winged grasshopper is most commonly observed within sand parkland, particularly areas domianted by native forbs in sand parkland. However, Zayante band-winged grasshopper is also observed within canopy gaps in Sandhills chaparral communities, including silverleaf manzanita chaparral, particularly those adjacent to sand parkland (McGraw et al. 2020).

Zayante band-winged grasshopper was listed as federally endangered on January 24, 1997 (USFWS 1997). In 2001, the Service designated 10,560 acres in central Santa Cruz County within the known distribution of the Zayante band-winged grasshopper as critical habitat for the species. The primary constituent elements of critical habitat for the Zayante band-winged grasshopper are the presence of Zayante soils, the occurrence of Zayante Sandhills habitat, and the associated plant species, and certain microhabitat conditions, including areas that receive large amounts of sunlight, widely scattered tree and shrub cover, bare or sparsely vegetated ground, and loose sand (USFWS 2001).

3.3.2.2.2 Habitat in the Survey Area

The survey areas centered on the Newell Creek Road, Pipeline Road, and Graham Hill Road North sections of the Proposed Project feature open areas of silverleaf manzanita chaparral that is moderately suitable for Zayante band winged grasshopper; the Glen Arbor Road Section features habitat of low suitability while the species is not expected to occur along the Graham Hill Road South Section (Table 10, Figure 9). Zayante band-winged grasshopper has been observed in the Sandhills habitat within the survey areas along the Mount Hermon Road and Quail Hollow Road Alternative Sections (Table 11).

Within the Proposed Project Work Area, which is centered on the roads and features adjacent right-of-ways, Zayante band-winged grasshopper has some limited potential to occur within road turn outs on Zayante soil adjacent to suitable habitat; these areas feature loose sand soil and open canopies as well as sparse, primarily herbaceous vegetation that are suitable for this species.

3.3.2.3 Santa Cruz Kangaroo Rat

3.3.2.3.1 Description and Status

Santa Cruz kangaroo rat (*Dipodomys venustus venustus*) is five-toed, narrow-faced rodent in the family Heteromyidae. Though historically known from locations in the foothills of the Santa Cruz Mountains (Best 1992, Bolster 1998), the subspecies is currently only known to inhabit two areas: Mount Hermon atop Graham Hill Road in central Santa Cruz County (Bean 2004) and chaparral within the Sierra Azul Open Space Preserve in the Summit Area of the Santa Cruz Mountains (K. Hickman, pers. com. 2019). Within the Sandhills, Santa Cruz kangaroo rat is known primarily from silverleaf manzanita chaparral (Roest 1988, Bean 2004), though the species may also occur in adjacent areas of ponderosa pine forest that feature a significant shrub component. Santa Cruz kangaroo rats are nocturnal, granivorous, and inhabit underground burrows. The diet of the Santa Cruz kangaroo rat consists almost entire of the seeds of annual plants, which they collect during the summer and store in surface caches (Bean 2004).

Although not designated as a Species of Special Concern, Santa Cruz kangaroo rat is on the California Department of Fish and Wildlife's Special Animals List (CDFW 2019); the species is critically imperiled due to its limited distribution and abundance.

3.3.2.3.2 Habitat in the Survey Area

The Graham Hill Road North Section of the proposed project bisects the Santa Cruz kangaroo rat occurrence atop Mount Hermon, where the species has been trapped within Henry Cowell State Park on the south side of the road (Bean 2004) and in the County of Santa Cruz Juvenile Hall Parcel on the north

side of the Road (Biosearch Associates 2013). The survey areas along the Newell Creek Road, Glen Arbor Road, and Pipeline Road sections of the Proposed Project survey area all feature silverleaf manzanita chaparral habitat that is highly suitable for the species (Figure 10). The patches of Sandhills chaparral in the Mount Hermon Road Alternative Section survey area have moderate suitability for the species, while those along the Quail Hollow Road Alternative Section are highly suitable (Table 11).

Santa Cruz kangaroo rat could disperse within the Proposed Project Work Area, including the road and road right-of-way; habitat adjacent to the road may also features burrows for this species, which has been trapped near Graham Hill Road (Biosearch Associates 2013). The species was observed during installation of a water pipeline within a road atop Mount Hermon (J. McGraw, pers. obs. 2016).

4 Summary

The 1,618-acre Newell Creek Pipeline Replacement Project survey area, which includes both the survey areas for both the Proposed Project and Alternative Sections, feature a total of 745 acres within the Sandhills ecosystem (Table 8, Figure 2), which is defined based on the preserve of Zayante sand soil (Section 2.4.1). Of the total 745 acres of Sandhills ecosystem, 407 acres are in the Proposed Project survey area, where they are concentrated in the Graham Hill Road North Section, with smaller areas of Sandhills ecosystems also found in the Glen Arbor Road, Newell Creek Road, and Graham Hill Road South sections (Table 8, Figure 2). The remaining 329 acres of the Sandhills ecosystem mapped as part of this survey are within the Alternative Sections survey area contains (Table 8, Figure 2).

Sandhills Communities

The Proposed Project survey area features three main Sandhills communities, which were classified based on their structure and species composition and also characterized according to their conditions that can influences species habitat, including land use (Section 2.4.2, Tables 5 and 9, Figure 3).

1. **Silverleaf manzanita chaparral (Section 3.2.1):** 48 acres are dominated by shrubs including the Sandhills endemic silverleaf manzanita (*Arctostaphylos silvicola*). This form of northern maritime chaparral is a sensitive plant community (CDFW 2020) and a sensitive habitat (County of Santa Cruz 1994).
2. **Ponderosa pine forest (Section 3.2.2):** 221 acres feature forests that contain ponderosa pine (*Pinus ponderosa*) and associated hardwoods including primarily coast live oak (*Quercus agrifolia*) and Pacific madrone (*Arbutus menziesii*) in with an understory of shade-tolerant shrubs, vines, and ferns. Though Sandhills ponderosa pine forests are not classified in the *Manual of California Vegetation* (Sawyer et al. 2021) and, therefore, are not listed as a sensitive habitat (CDFW 2020), this unique community is recognized as a sensitive habitat and special forest by the County of Santa Cruz (1994).
3. **Coast live oak woodland (Section 3.2.3):** 142 acres support woodlands on Zayante soil that are dominated by coast live oak and feature primarily shade-tolerant vines and herbs in the understory. Located in mesic microsites including at the ecotone between Sandhills and other systems (e.g., riparian forests), these coast live oak woodlands feature different plant species composition than the more widespread coast live oak woodlands on loam soils in the region; they also support rare Sandhills species such as the Mount Hermon June beetle (Section 3.3.2.1). Like the Sandhills ponderosa pine forests, coast live oak woodlands in the Sandhills have not been previously characterized and therefore are not yet classified as sensitive natural communities (CDFW 2020); however, like all Sandhills habitat that support rare and endangered species, they meet the criteria for sensitive habitat by the County of Santa Cruz (1994).

The Alternative Sections survey area also features the three communities classified in the survey area for the Proposed Project, as well as other Sandhills community types, including sand parkland, which is extremely rare (~250 acres) and highly diverse and supports additional rare species (McGraw 2004b).

The Sandhills communities in the survey areas (Table 6) vary in the following conditions that can influence their use by rare Sandhills species: 1) 314 acres feature modifications due to prior land uses, including primarily development and road building; and 2) 156 acres support transitional and successional communities that occur on soils that are transitional between typical Zayante coarse sand

soil and loam soils and/or occur in areas that have been long unburned, where species that predominant on loam soils, including Pacific Douglas-fir (*Pseudotsuga menziesii*), have become established in the absence of fire. These conditions were characterized as part of the community mapping to aid evaluation of the rare species habitat (Table 9).

Sandhills Species

Five of the seven special-status Sandhills species evaluated as part of this assessment (Table 1) have been previously observed, and/or were observed during the course of this assessment, within the Proposed Project survey area (Table 10, Figures 4-10). The other two species, Ben Lomond wallflower and Zayante band-winged grasshopper, have moderate potential to occur within open silverleaf manzanita chaparral in a relatively small portion (11 and 16 acres, respectively) of the Newell Creek Road Section of the Proposed Project survey area (Figures 5 and 9). In addition, Zayante band-winged grasshopper has moderate potential to occur in a 2-acre area of recently burned Sandhills within the survey area along the Pipeline Road Section (Figure 9).

The Quail Hollow Road and Mount Hermon Road Alternative Sections both feature Sandhills habitat in which all Sandhills special-status species have been previously observed, *except* for the Santa Cruz kangaroo rat, which has moderate potential to occur in the Mount Hermon Road Alternative Section and high potential to occur in the Quail Hollow Road Alternative Section (Table 11).

The following briefly summarizes the results of the habitat assessment for the special-status Sandhills species, which are described in greater detail in the referenced sections.

- **Ben Lomond spineflower (Section 3.3.1.1):** This federally listed endangered annual plant endemic to the Sandhills inhabits canopy gaps in all three mapped Sandhills communities. The species has been previously observed and has moderate to high potential to occur in all of the Proposed Project survey area sections except Graham Hill Road South (Table 10, Figure 4). The species is known to occur in the Quail Hollow Road and Mount Hermon Road Alternative Sections (Table 11). Adapted to disturbance, it has high potential to occur within road turn outs and other areas of open Zayante sand soil in the Project Work Area.
- **Ben Lomond wallflower (Section 3.3.1.2):** This state and federally listed endangered biennial to short-lived perennial plant endemic to the Sandhills occurs primarily in sand parkland community, which does not occur in the Proposed Project survey area; however, it can also occur in canopy gaps within other Sandhills communities including silverleaf manzanita chaparral. The species has moderate potential to occur in the survey area along the Newell Creek Road Section (Table 10, Figure 5) and has been observed along the Alternative Sections (Table 11). Although adapted to disturbance, Ben Lomond wallflower is unlikely to inhabit road turn outs, though it may occur on road cuts and other less frequently disturbed areas of open Zayante sand soil in the Project Work Area.
- **Ben Lomond buckwheat (Section 3.3.1.3):** This rare (CRPR 1B.1) perennial plant endemic to the Sandhills occurs in all three mapped Sandhills communities in the Proposed Project survey area, where it is found in open areas as well as near shrubs and trees. Within the Proposed Project survey area, the species was observed within the Newell Creek Road and Graham Hill Road North sections during the assessment and has moderate potential to occur in the Glen Arbor Road section (Figure 6); Ben Lomond buckwheat has also been previously observed within the Quail Hollow Road and Mount Hermon Road Alternative Sections survey area (Table 11). Ben

Lomond buckwheat inhabits road cuts and road turn outs featuring Zayante sand soil within and adjacent to the Project Work Area.

- **Silverleaf manzanita (Section 3.3.1.4):** This rare (CRPR 1B.1) shrub endemic to the Sandhills dominates the silverleaf manzanita chaparral, and also occurs in the understory (albeit at lower abundance) in the ponderosa pine forest and (to a lesser extent) coast live oak woodland in the Proposed Project survey area. Silverleaf manzanita was observed during the assessment along all of the Proposed Project sections and Alternative Sections except Graham Hill Road South (Tables 10 and 11, Figure 7). Silverleaf manzanita grows in and adjacent to the road right-of-way within the Project Work Area.
- **Mount Hermon June beetle (Section 3.3.2.1)**: This federally listed endangered insect is endemic to the Sandhills, where it occurs throughout the full range of Sandhills communities as well as other land cover types, including developed areas; it has also been previously observed within sandy loam soils adjacent to the Sandhills. The fossorial beetle has been previously observed or has high potential to occur within the survey areas for all of the Proposed Project sections and Alternative Sections (Tables 10 and 11, Figure 8). It can occur in portions of the Project Work Area that are in or near the Sandhills ecosystem, including the unpaved areas adjacent to the road as well as underneath pavement, where larvae of the species follow roots on which they feed.
- **Zayante band-winged grasshopper (Section 3.3.2.2):** This federally listed endangered insect is endemic to the Sandhills, where it primarily inhabits the sand parkland community, canopy gaps in Sandhills chaparral communities adjacent to sand parkland, and other areas of open, loose sand soil that are sparsely vegetated by primarily herbaceous plants and subshrubs. Zayante band-winged grasshopper has moderate potential to occur in the Newell Creek Road section of the Proposed Project survey area, while the species inhabits habitat bisected by both the Quail Hollow Road and Mount Hermon Road Alternative Sections (Tables 10 and 11, Figure 9). Zayante band-winged grasshopper could disperse into areas of loose sand soil adjacent to the road including road turn outs in the Project Work Area where it occurs adjacent to occupied habitat.
- **Santa Cruz kangaroo rat (Section 3.3.2.3):** Endemic to shrublands in the Santa Cruz Mountains Bioregion, this exceptionally rare animal is known from only two locations, one of which is atop Mount Hermon between Felton and Scotts Valley. Occupied habitat for the species in this location is bisected by Graham Hill Road, which is part of the Proposed Project pipeline alignment (Table 10, Figure 10). The species has the potential to occur in the silverleaf manzanita chaparral community in and near the Project Work Area and was previously observed during installation of a prior water pipeline in this area.

This habitat assessment is provided to aid evaluation of the Proposed Project and its alternatives under the California Environmental Quality Act (CEQA). It can also be used to inform development of mitigations to reduce impacts of the project on sensitive biological resources of the Sandhills under CEQA and in compliance with the Federal Endangered Species Act. Specific recommendations will be developed as part of a subsequent phase of this project.

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Appendix C

Rare Plant Survey

RARE PLANT SURVEY FOR THE NEWELL CREEK PIPELINE IMPROVEMENT PROJECT: BRACKNEY NORTH, GRAHAM HILL ROAD NORTH, AND GRAHAM HILL ROAD SOUTH PIPELINE SECTIONS



Prepared by:

Jodi McGraw, Ph.D.
Jodi McGraw Consulting
PO Box 221 • Freedom, CA 95019 • (831) 768-6988
jodi@jodimcgrawconsulting.com
www.jodimcgrawconsulting.com

Submitted to:

Dudek
1630 San Pablo Avenue, Suite 300
Oakland, CA 94612

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1 Introduction

1.1 Project

The City of Santa Cruz Water Department (City) is planning to implement the Newell Creek Pipeline Improvement Project, which will install a new pipeline to convey water from the Loch Lomond Reservoir to the Graham Hill Water Treatment Plant. Currently, water is conveyed from the Newell Creek Dam, which creates the reservoir, to the water treatment plant via the 9.25-mile Newell Creek Pipeline (Figure 1). The pipeline was constructed in 1960 and is reaching the end of its useful life; accordingly, the City has conducted a series of technical studies to evaluate replacement and/or rehabilitation alternatives.

Based on its prior analysis, the City proposes to replace 8.75 miles of the existing pipeline with a new 24-inch pipe. The pipeline would generally be installed underneath existing, paved roads, in the road right-of-way (ROW), existing City easements, or withing a new easement in the case of the Brackney North section. The proposed northern segment from Newell Creek Access Road Bridge to the Felton Booster Pump Station would generally follow the existing pipeline alignment, with a few short re-alignments to avoid crossing private property, except for one location in the Brackney North section; wherever possible, the new pipeline would be installed parallel to the existing pipeline, except in the Brackney North section. The proposed southern segment, which extends from the booster pump station to the water treatment plant, generally includes a new pipeline section along Graham Hill Road. Once the new pipeline is installed and the interconnections are made, the existing pipeline would be removed or abandoned in place (City of Santa Cruz 2021).

1.2 Pipeline Alignment

Although the proposed project alignment occurs largely within paved roads, portions of the alignment (e.g., Brackney North) occur within an unpaved City easement on private property. Moreover, the Project Work Area, which is where construction activities are anticipated to occur for three proposed pipeline segments (Brackney North, Graham Hill North, and Graham Hill South), includes unpaved areas adjacent to the paved roadway. This Project Work Area includes patches of native plant communities including coast live oak woodland, coast redwood forest, and riparian woodlands (Dudek 2021a) as well as outcroppings of Zayante sand soil which support the Santa Cruz Sandhills (Sandhills)—an endemic ecosystem in central Santa Cruz that supports several special-status plants and animals (McGraw 2021).

1.3 Rare Plant Survey Goal and Objectives

To assist the City with planning and permitting of the project, including preparation of the project Environmental Impact Report, Jodi McGraw Consulting (JMc) conducted a rare plant survey to evaluate the occurrence of special-status plant species within three of the pipeline alignments where project activities are anticipated to occur in earlier phases of project: Brackney North, Graham Hill North, and Graham Hill South. The proposed project includes multiple phases which will be implemented in later years; however, this rare plant survey was focused on the highest priority segments, which are stated above. For the purposes of this report, rare and special-status plant species are used interchangeably and include: 1) species designated as either rare, threatened, or endangered by the California Department of Fish and Wildlife (CDFW) or U.S. Fish and Wildlife Service (USFWS) and are protected under either California Endangered Species Act (CESA; CFCG 2050 et seq.) or Federal Endangered

Species Act (FESA; 16 USC 1531 et seq.); 2) species that are candidate species being considered or proposed for listing under CESA or FESA; 3) species that are included on the CDFW Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2021a) or species with a California Rare Plant Rank (CRPR) of 1 or 2 in the California Native Plant Society's Inventory of Rare and Endangered Plants of California (CNPS Inventory; CNPS 2021); and/or 4) species given protection under the County's General Plan/Local Coastal Program and applicable ordinances.

The goal of this rare plant survey was to map the distribution and quantify the abundance of rare plant species within the Project Work Area for the three pipeline alignments, which collectively constitute the Survey Area. This survey was focused on the pipeline alignments with the highest priority for replacement out of the entire Newell Creek Pipeline - Brackney North, Graham Hill North, and Graham Hill South. The objectives of the survey were to:

1. **Identify target plant species:** Compile a list of the special-status plant species that have moderate to high potential to occur within the Survey Area based on a review of databases and spatial data, and prior assessments for the proposed project, including the plant communities map (Dudek 2021a) and Sandhills habitat assessment (McGraw 2021);
2. **Survey for rare plants**, throughout the period flowering period for the target species, based on their published phenologies and observations of reference sites (known occurrences);
3. **Map all special-status plants observed**, including target and non-target species, following mapping rules designed to facilitate accurate delineation of their occurrences using global positioning systems and geographic information systems technology;
4. **Assess the abundance of each species** in each mapped patch; and
5. **Compile a floristic species list** of all plants observed in each of the three alignments.

1.4 Report

The *Methods* (Section 2) outlines how survey objectives were achieved while the *Results* (Section 3) describes the findings. The information in this rare plant survey report can inform the City's efforts to plan and permit the project; specifically, it can aid in the evaluation of the proposed project and project alternatives under the California Environmental Quality Act (CEQA) and help inform development of mitigations to reduce impacts of the project on special-status plants.

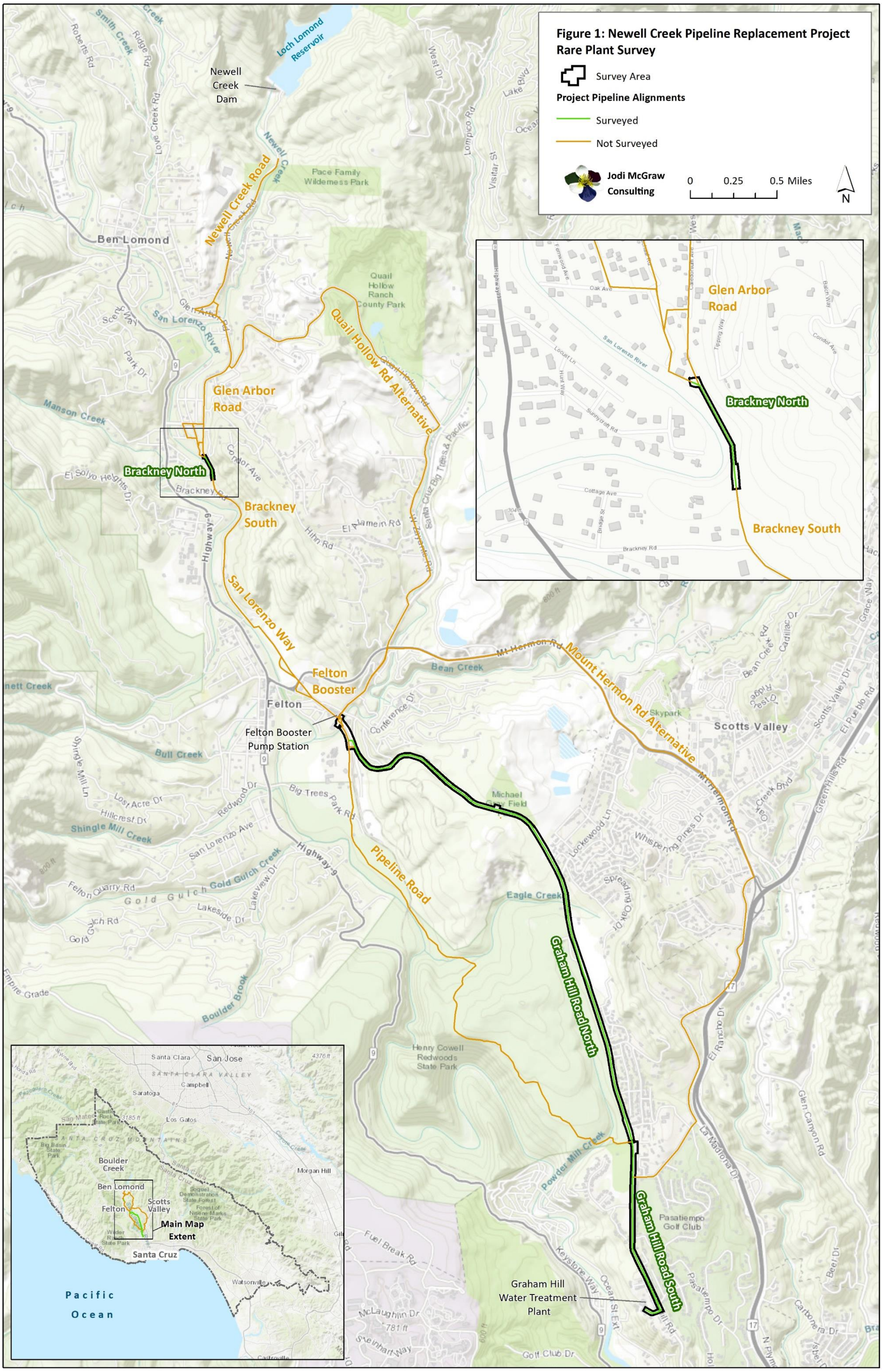


Figure 1: Newell Creek Pipeline Improvement Project Rare Plant Survey Area

2 Methods

2.1 Study Region

The Newell Creek Pipeline Improvement Project (Project) Area is located between the City of Santa Cruz to the south, the town of Ben Lomond to the north and west, and the City of Scotts Valley in the east (Figure 1).

2.2 Survey Area

The Survey Area for this rare plant survey was the Project Work Area for three pipeline alignments which totals 40.7 acres (Table 1). The Project Work Area (and thus Survey Area) captures the area around the project pipeline in which all construction activities, including grading, excavation, and staging would occur.

Table 1: Project Pipeline Sections subject to Rare Plant Survey

Pipeline Section	Length (feet)	Project Work Area/Survey Area (Acres)	% of Total Survey Area
Brackney North	734	0.3	0.7%
Graham Hill Road North	18,385	30.0	73.7%
Graham Hill Road South	5,866	10.5	25.7%
Total	**24,985**	**40.7**	**100.0%**

2.3 Target Species

A list of target rare plant species was initially identified for the survey in coordination with biologists from Dudek. First, Dudek biologists assembled a list of special-status plant species potentially occurring within the entire Newell Creek Pipeline Improvement Project, plus a 300-foot buffer on both sides of the proposed pipeline. This list was based on a comprehensive literature review and database search of the following sources: County of Santa Cruz Online GIS database (County of Santa Cruz 2021), the CDFW California Natural Diversity Database (CDFW 2021), the USFWS Inventory for Planning and Conservation (IPaC) database (USFWS 2021), the CNPS Inventory of Rare and Endangered Plants data (CNPS Inventory) (CNPS 2021), and the U.S. Department of Agriculture Web Soil Survey (USDA 1980). Each species was evaluated for its potential to occur in the Project Area based on its documented occurrences in the region, life history, and general habitat requirements. These species were then determined to have low, moderate, or high potential to occur; or were not expected to occur within the Project Area, based on the overall suitability of the habitat within the Project Area to support such species. The list and potential to occur determinations also reflected the prior Sandhills habitat assessment, which identified occurrences of special-status plants of the Sandhills within the entire Project Area (McGraw 2021).

Second, Jodi McGraw Consulting reviewed the overall project list of special-status plants with potential to occur in the overall NCP Project Area to identify those with potential to occur in the Survey Area. This target species list is identified in Table 2.

This target species list was used to focus the survey on the rare plants most likely to be observed; specifically, the target species list was used to inform the timing of surveys by evaluating the phenology of the target species in references sites (Section 2.4). However, all plant species were evaluated for their occurrence in the Survey Area as part of the floristic analysis (Section 2.5).

2.4 Reference Sites

To inform the timing of the surveys, reference sites for the target species were selected by using the CNDDB (CDFW 2021) and CalFlora (CalFlora 2021) to identify known occurrences of the rare plants. Where multiple occurrences were identified in Santa Cruz County, the occurrence with habitat most similar to that within the Survey Area, based on the abiotic conditions, plant community, and proximity, was selected. The designated reference sites were checked for the occurrence of target rare plants based on their flowering period (Table 2) and the results were used to time the surveys.

2.5 Surveys

The Survey Area was visually evaluated for the occurrence of rare plants including the target species as well as any other rare plant species. The surveys occurred during three timeframes designed to span the flowering season for the target species and most plant species in the region:

- Early Season: April 19, 21, and 22;
- Mid-Season: June 3 and 4; and
- Late-Season: July 14 and 15.

During each survey period, Dr. Jodi McGraw walked the Survey Area and compiled a list of plant species encountered (Appendix A). This list does not include ornamental plant species installed into landscaped areas, including along Graham Hill Road; instead it includes native and naturalized non-native plant species that occur in natural and semi-natural environments. During the June 3 survey, local bryologist Ken Kellman examined the Brackney site and identified moss samples collected by Jodi McGraw from the other pipeline alignments, which had far fewer bryophytes and lacked suitable habitat for the rare bryophytes targeted (Table 2). The locations of rare plant species were recorded using a GPS. These initial mapped locations were revisited for detailed mapping and assessment of abundance when the plant species were deemed to be maximally visible, based on their phenology.

2.6 Mapping

On April 26 and 27, the rare plant species encountered during the mid-April site visit were revisited to:

1. Map the locations of discrete patches; and
2. Quantify abundance of the plants within each patch.

Table 2: Target rare plant species with moderate to high potential to occur in the Project Work Area/Survey Area, showing Habitat and Reference Site Location and Observations (adapted from Dudek 2021b)

Species	Status (Federal/State/CRPR)	Primary Habitat Associations, Life Form, Flowering Period, and Elevation Range (feet)	Reference Site and Observations
Anderson's manzanita (*Arctostaphylos andersonii*)	None/None/1B.2	Broad-leafed upland forest, Chaparral, North Coast coniferous forest; openings, edges/perennial evergreen shrub/Nov–May/197–2,490	Perennial species that can be detected year-round
Silverleaf (Bonny Doon manzanita) (*Arctostaphylos silvicola*)	None/None/1B.2	Closed-cone coniferous forest, Chaparral, Lower montane coniferous forest; inland marine sands/perennial evergreen shrub/Jan–Mar/394–1,965	Perennial species that can be detected year-round
deceiving sedge (*Carex saliniformis*)	None/None/1B.2	Coastal prairie, Coastal scrub, Meadows and seeps, Marshes and swamps (coastal salt); mesic/perennial rhizomatous herb/June(July)/10–755	Checked Upper UCSC forested areas though not detected; species is perennial, however.
Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*)	FE/None/1B.1	Lower montane coniferous forest (maritime ponderosa pine sandhills)/annual herb/Apr–July/295–2,000	Observed in flower April 2021 at Quail Hollow Quarry Conservation Areas
robust spineflower (*Chorizanthe robusta* var. *robusta*)	FE/None/1B.1	Chaparral (maritime), Cismontane woodland (openings), Coastal dunes, Coastal scrub; sandy or gravelly/annual herb/Apr–Sep/10–985	Observed in flower May 2021 along Ponza Lane (Soquel Hills Area)
tear drop moss (*Dacryophyllum falcifolium*)	None/None/1B.3	North Coast coniferous forest; carbonate/moss/N.A./	Perennial species that can be detected year-round
Ben Lomond buckwheat (*Eriogonum nudum* var. *decurrens*)	None/None/1B.1	Chaparral, Cismontane woodland, Lower montane coniferous forest (maritime ponderosa pine sandhills); sandy/perennial herb/June–Oct/164–2,620	Perennial species that can be detected year-round

Table 2: Target rare plant species with moderate to high potential to occur in the Project Work Area/Survey Area, showing Habitat and Reference Site Location and Observations (adapted from Dudek 2021b)

Species	Status (Federal/State/CRPR)	Primary Habitat Associations, Life Form, Flowering Period, and Elevation Range (feet)	Reference Site and Observations
Santa Cruz wallflower (*Erysimum teretifolium*)	FE/SE/1B.1	Chaparral, Lower montane coniferous forest; inland marine sands/perennial herb/Mar–July/394–2,000	Observed in flower April 2021 at Quail Hollow Quarry Conservation Areas
minute pocket moss (*Fissidens pauperculus*)	None/None/1B.2	North Coast coniferous forest (damp coastal soil)/moss/N.A./33–3,355	None needed (perennial)
Santa Cruz tarplant (*Holocarpha macradenia*)	FT/SE/1B.1	Coastal prairie, Coastal scrub, Valley and foothill grassland; often clay, sandy/annual herb/June–Oct/33–720	Observed in flower July 2021 at Arana Gulch
Kellogg's horkelia (*Horkelia cuneata* var. *sericea*)	None/None/1B.1	Closed-cone coniferous forest, Chaparral (maritime), Coastal dunes, Coastal scrub; sandy or gravelly, openings/perennial herb/Apr–Sep/33–655	Observed in flower April 2021 at Marshall Field (UCSC Upper Campus)
Point Reyes horkelia (*Horkelia marinensis*)	None/None/1B.2	Coastal dunes, Coastal prairie, Coastal scrub; sandy/perennial herb/May–Sep/16–2,475	Observed in flower April 2021 at Marshall Field (UCSC Upper Campus)
northern curly-leaved monardella (*Monardella sinuata* ssp. *nigrescens*)	None/None/1B.2	Chaparral (SCR Co.), Coastal dunes, Coastal scrub, Lower montane coniferous forest (SCR Co., ponderosa pine sandhills); Sandy./annual herb/(Apr)May–July(Aug–Sep)/0–985	Observed in flower June 2021 at Quail Hollow Quarry Conservation Areas
woodland woolythreads (*Monolopia gracilens*)	None/None/1B.2	Broad-leafed upland forest (openings), Chaparral (openings), Cismontane woodland, North Coast coniferous forest (openings), Valley and foothill grassland; Serpentine/annual herb/(Feb)Mar–July/328–3,935	Checked Quail Hollow Ranch County Park Woodrat Trail April and May 2021; not detected, however.

Table 2: Target rare plant species with moderate to high potential to occur in the Project Work Area/Survey Area, showing Habitat and Reference Site Location and Observations (adapted from Dudek 2021b)

Species	Status (Federal/State/CRPR)	Primary Habitat Associations, Life Form, Flowering Period, and Elevation Range (feet)	Reference Site and Observations
Choris' popcornflower (*Plagiobothrys chorisianus* var. *chorisianus*)	None/None/1B.2	Chaparral, Coastal prairie, Coastal scrub; mesic/annual herb/Mar–June/10–525	Checked Moore Creek Preserve, Woods Cove Preserve, and Marshall Field; not detected, however.
San Francisco popcornflower (*Plagiobothrys diffusus*)	None/SE/1B.1	Coastal prairie, Valley and foothill grassland/annual herb/Mar–June/197–1,180	Observed in flower in May 2021 at Marshall Field.

No other rare plant species were encountered during the mid-season and late-season assessments; as a result, no additional mapping occurred.

On April 26 and 27, the area in which the rare plants were previously recorded during the surveys (Section 2.5) was carefully walked and the patches were mapped using the following mapping rules, which were designed to precisely delineate patches.

All rare plants of the same species within 4 meters (m) of each other were operationally defined as being in the same patch. Patches occupying less than a 1 m^2 area were mapped using point features, for which the actual dimensions were recorded. Patches greater than 1 m^2 were mapped as convex polygons using the GPS, by collecting vertices to capture the outer boundaries of the patch.

Abundance was assessed using a census (complete count). For perennial species, the count was conducted by life stage:

1. **Seedling:** first year plant (plant that established during the current growing season);
2. **Juvenile:** plant that is not a first-year plant and is not reproductive;
3. **Adult:** plant that features flowers or fruits or has reproduced in the past (as evidenced by prior reproductive structures).

Silverleaf manzanita, Bonny Doon manzanita, (*Arctostaphylos silvicola*) grows through a process known as layering, in which later branches become rooted, which can make it difficult to differentiate and account individuals, particularly where they occur with overlapping canopies. The number of adults was determined by tracing branches back to the main origin (trunk); however, there may be some error in the census as a result of this.

Additionally, silverleaf manzanita hybridizes with other manzanitas, including crinite manzanita (*A. crustacea* ssp. *crinita*)—a burl forming species with which silverleaf manzanita, an obligate seeding species, co-occurs in the Survey Area. When other vegetative characteristics, including most notably the presence of hairs (bristles) on the leaves and stems were intermediate or variable, plants lacking a visible burl were counted as *A. silvicola* whereas plants with a burl were considered *A. crustacea* ssp. *crinita*.

3 Results

3.1 Rare Species

Two rare plant species were encountered during the survey of the Graham Hill Road North Project Area :

- Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*); and
- Silverleaf (Bonny Doon) manzanita (*Arctostaphylos silvicola*).

In addition, Ben Lomond buckwheat (*Eriogonum nudum* var. *decurrens*) was observed in two locations just 35 feet north of the Graham Hill Road North Project Work Area/Survey Area.

No rare plants were observed in the Graham Hill Road South or Brackney North project areas.

Across the entire Survey Area, a total of 215 plant species were observed (Appendix A).

3.2 Distribution and Abundance

The two rare plant species were observed along a 4,094-foot-long portion of the Graham Hill Road North Alignment spanning just west of 3650 Graham Hill Road to the northwest and 3000 Graham Hill Road to the southeast (Figures 2-1 through 2-5). This portion of the project alignment traverses Zayante sand soil which supports Sandhills plant communities, to which the rare species are endemic.

The following sections describe the number and size of patches as well as the abundance (count) of plants of each of the species within the Project Work Area/Survey Area. It is important to note that the patches mapped are oftentimes part of larger patches that extend outside of the Project Work Area/Survey Area, just beyond which there are additional unmapped occurrences as well.

3.2.1 Ben Lomond Spineflower

Ben Lomond spineflower was observed in 10 patches totaling just 294 square feet. Patches were small, ranging between 0.0064 square feet (sf) and 146 sf, and averaging just 29 sf. They occurred in canopy gaps between established shrubs and trees, and in turn outs along Graham Hill Road.

The patches featured a total of approximately 1,320 flowering (adult) plants (Table 3). Patches featured between 1 and 470 plants, with an average of 132 plants (Std. Dev. = 177.5; Appendix B).

Table 3: Rare plants patches in the Survey Area

	Number of	Patch Area (sf)				Number of Plants			
Species	Patches	Total	Mean	Minimum	Maximum	Total	Seedlings	Juveniles	Adults
Ben Lomond spineflower	10	294	29	0.0064	146	1,320	0	0	1,320
Silverleaf Manzanita	32	13,360	418	0.2085	2,132	125	2	10	113
Total	42	13,654	325	0.0064	2,132	1,445	2	10	1,433



Figure 2-1: Rare Plants within the Newell Creek Pipeline Improvement Project Survey Area



Figure 2-2: Newell Creek Pipeline Improvement Project
Rare Plant Survey

Figure 2-2: Rare Plants within the Newell Creek Pipeline Improvement Project Survey Area



Figure 2-3: Rare Plants within the Newell Creek Pipeline Improvement Project Survey Area



Figure 2-4: Newell Creek Pipeline Improvement Project
Rare Plant Survey

Figure 2-4: Rare Plants within the Newell Creek Pipeline Improvement Project Survey Area



Figure 2- 5: Newell Creek Pipeline Improvement Project
Rare Plant Survey

Figure 2-5: Rare Plants within the Newell Creek Pipeline Improvement Project Survey Area

Ben Lomond spineflower is a small annual herb of the buckwheat family (Polygonaceae). The species is endemic to the Sandhills where it primarily inhabits open, sparsely vegetated areas (McGraw and Levin 1998, McGraw 2004a,b) in sand parkland and gaps within the Sandhills chaparral, though can also be found at low abundance around the edges of trees or in canopy gaps in Sandhills woodlands and forests (McGraw 2004b, McGraw 2015). This disturbance-adapted species preferentially occurs in areas of natural disturbance, including slides, trails, and on gopher mounds, which maintain the open canopy and soil conditions it requires (McGraw 2004a). As a result of its adaptation to disturbance, Ben Lomond spineflower also inhabits areas that have been modified by prior land use, including sand mines, residentially developed areas, and road turn outs (McGraw 2004b, USFWS et al. 2011). The Ben Lomond spineflower was listed as federally endangered on February 4, 1994 (USFWS 1994). Critical habitat has not been designated for the species, which has a California Rare Plant Rank of 1B.1 reflecting that the species is seriously threatened in California, with over 80% of occurrences that are threatened (CNPS 2021).

3.2.2 Silverleaf Manzanita

Silverleaf manzanita was observed in a total of 32 patches which total 13,360 sf. Patch size ranged from just 0.2085 sf to 2,132 sf, with an average of 418 sf (Table 3). The patches contain a total of 125 individuals of which 113 were adults, 10 were juveniles, and 2 were seedlings.

Silverleaf manzanita is a large, evergreen shrub (1-6 m) in the heath family (Ericaceae), which is named for the grey-green color of its leaves. Silverleaf manzanita is one of the dominant species in the Sandhills, and a key indicator of the Sandhills ecosystem (McGraw 2004b). Within the Sandhills, the species primarily occurs in Sandhills chaparral communities, including silverleaf manzanita chaparral; it also occurs at lower density in the mixed sand chaparral, which also supports crinite manzanita (*Arctostaphylos crustacea* spp. *crinita*), buck brush, chamise, yerba santa, and other chaparral shrubs (McGraw 2004b). As Sandhills chaparral communities are successional in the absence of fire (McGraw 2004b), silverleaf manzanita can be found at lower abundance in the understory of ponderosa pine forest, coast live oak woodland, and other forests and woodlands on Zayante sand soil, particularly in areas that are long unburned.

Endemic to the Sandhills, silverleaf manzanita has a California Rare Plant Rank of 1B.2, which reflects its fairly endangered in California, with 20% to 80% of occurrences that are threatened, as a result of its geographic range, habitat specificity, and multiple threats to remaining populations (CNPS 2021).

4 Summary and Conclusions

The Project Work Area for the Graham Hill Road North alignment supports Ben Lomond spineflower, a federally listed endangered and CRPR 1B.1 annual plant, and silverleaf manzanita (Bonny Doon manzanita), a shrub designated CRPR 1B.2. The two rare plant species occur along a 4,094-foot-long portion of the pipeline alignment that traverses the Santa Cruz Sandhills; the patches were observed just west of 3650 Graham Hill Road in the northwest and 3000 Graham Hill Road in the southeast (Figures 2-1 to 2-5).

Ben Lomond spineflower occupies 10 patches totaling 294 square feet, which contain a total of 1,320 individuals. Silverleaf manzanita was mapped in 32 patches totaling 13,360 sf, which featured 125 individuals: 113 adults, 10 juveniles, and 2 seedlings.

These plants, which are endemic to the Santa Cruz sandhills ecosystem, occur with a much broader distribution atop the Mount Hermon area that is traversed by the pipeline, including additional area just beyond the Work Area/Survey Area; that is, many of the mapped patches extend further away from the paved roadway in which the pipeline is located. Ben Lomond buckwheat was observed in two locations just 35 feet north of the Project Work Area. These and other sandhills rare plants may also occur as dormant seed in the soil (i.e., the soil seed bank).

No other rare plant species, including the other 14 target plant species (Table 2), were observed in the Project Work Area/Survey Area, which featured a total of 215 native and naturalized non-native plant species (Appendix A). The Survey Area also features additional ornamental plant species in landscaped areas. There is some potential that additional target or other rare species occur below ground in the soil seed bank, evading detection during this survey. Some of the target species, such as Santa Cruz wallflower, are disturbance-adapted and establish following fire or other natural or anthropogenic factors that removes established vegetation, frees-up resources, and/or promotes seed germination (McGraw 2004a).

The survey occurred in the second of two years of below-average rainfall. In Boulder Creek California, 2019-20 saw just 21.4 inches of rain, which is just 42% of the average 51.5 inches per year; 2020-21 received just 17 inches (33% of average; SLVWD 2021). Such drought conditions can limit establishment and survivorship of rare plants, particularly annual plants.

Roadside mowing may have also reduced the ability to detect rare plants in the Graham Hill Road North alignment Work Area. The April surveys were initiated just as the County of Santa Cruz Public Works Department initiated mowing along Graham Hill Road. The April survey occurred before the mowing occurred in all areas except an approximately 0.25-mile long stretch of the southern portion of the Graham Hill Road North alignment, where crews had mowed prior to initiation of the survey. Mowing could have precluded detection of plants there as well as elsewhere in subsequent surveys (early June and mid-July) by removing the established plants.

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Appendix A: Plant Species List

Table A-1: Plant species observed during the survey. Exotic vascular plant species shown in bold font.

Section	Family	Scientific Name	Common Name
Mosses	Bryaceae	*Rosulabryum* sp.	
Mosses	Orthotrichaceae	*Orthotrichum* sp.	
Mosses	Leptodontaceae	*Alsia californica*	
Mosses	Brachytheciaceae	*Homalothecium arenarium*	
Mosses	Grimmiaceae	*Grimmia trichophylla*	
Mosses	Dicranaceae	*Dicranoweisia cirrata*	
Mosses	Leskeaceae	*Claopodium whippleanum*	
Mosses	Pottiaceae	*Didymodon vinealis*	
Mosses	Pottiaceae	*Syntrichia laevipila*	
Mosses	Pottiaceae	*Timmiella crassinervis*	
Mosses	Pottiaceae	*Weissia controversa*	
Mosses	Brachytheciaceae	*Brachythecium albicans*	
Mosses	Brachytheciaceae	*Scleropodium touretii*	
Mosses	Brachytheciaceae	*Scleropodium californicum*	
Mosses	Brachytheciaceae	*Homalothecium nuttallii*	
Mosses	Orthotrichaceae	*Orthotrichum coulteri*	
Mosses	Lembophyllaceae	*Isothecium cristatum*	
Mosses	Leucodontaceae	*Nogopterium gracile*	
Mosses	Leucodontaceae	*Antitrichia californica*	
Mosses	Bryaceae	*Gemmabryum kunzei*	
Mosses	Leptodontaceae	*Alsia californica*	
Mosses	Cryphaeaceae	*Dendroalsia abietina*	
Mosses	Polytrichaceae	*Atrichum selwynii*	
Mosses	Mielichoferiaceae	*Epipterygium tozeri*	
Liverworts	Aytoniaceae	*Cryptomitrium tenerum*	
Liverworts	Targioniaceae	*Targionia hypophylla*	
Ferns	Dennstaedtiaceae	*Pteridium aquilinum* var. *pubescens*	bracken fern
Ferns	Dryopteridaceae	*Dryopteris arguta*	coastal wood fern
Ferns	Dryopteridaceae	*Polystichum munitum*	western sword fern
Ferns	Equisetaceae	*Equisetum telmateia ssp. braunii*	giant horsetail
Ferns	Polypodiaceae	*Polypodium calirhiza*	nested polypody
Ferns	Polypodiaceae	*Polypodium glycyrrhiza*	licorice fern
Ferns	Pteridaceae	*Pellaea andromedifolia*	coffee fern
Ferns	Pteridaceae	*Pellaea mucronata var. mucronata*	bird's-foot fern
Ferns	Pteridaceae	*Pentagramma triangularis*	goldback fern

Table A-1: Plant species observed during the survey. Exotic vascular plant species shown in bold font.

Section	Family	Scientific Name	Common Name
Gymnosperms	Cupressaceae	*Sequoia sempervirens*	coast redwood
Gymnosperms	Pinaceae	*Pinus ponderosa* var. *pacifica*	Bentham's pine
Gymnosperms	Pinaceae	*Pseudotsuga menziesii var. menziesii*	Douglas-fir
Magnoliids	Lauraceae	*Umbellularia californica*	California bay
Eudicots	Adoxaceae	Sambucus nigra ssp. caerulea	blue elderberry
Eudicots	Aizoaceae	***Carpobrotus edulis***	Hottentot fig
Eudicots	Anacardiaceae	*Toxicodendron diversilobum*	western poison oak
Eudicots	Apiaceae	***Anthriscus caucalis***	bur-chervil
Eudicots	Apiaceae	***Conium maculatum***	poison hemlock
Eudicots	Apiaceae	*Osmorhiza berteroi*	sweet cicely
Eudicots	Apiaceae	*Sanicula crassicaulis var. crassicaulis*	Pacific sanicle, gambleweed
Eudicots	Apiaceae	***Torilis arvensis***	high sock-destroyer
Eudicots	Apiaceae	***Torilis nodosa***	short sock-destroyer
Eudicots	Apocynaceae	***Vinca major***	greater periwinkle
Eudicots	Araliaceae	***Hedera helix***	English ivy
Eudicots	Asteraceae	*Adenocaulon bicolor*	trail plant
Eudicots	Asteraceae	*Anisocarpus madioides*	woodland tarweed
Eudicots	Asteraceae	*Artemisia douglasiana*	mugwort
Eudicots	Asteraceae	*Baccharis pilularis ssp. consanguinea*	coyote brush
Eudicots	Asteraceae	***Carduus pycnocephalus ssp. pycnocephalus***	Italian thistle
Eudicots	Asteraceae	***Cirsium vulgare***	bull thistle
Eudicots	Asteraceae	*Corethrogyne filaginifolia*	common sand aster
Eudicots	Asteraceae	*Ericameria ericoides*	mock heather, California goldenbush
Eudicots	Asteraceae	*Heterotheca grandiflora*	telegraph weed
Eudicots	Asteraceae	*Heterotheca sessiliflora ssp. bolanderi*	Bolander's golden aster
Eudicots	Asteraceae	*Hieracium albiflorum*	white hawkweed
Eudicots	Asteraceae	***Hypochaeris glabra***	smooth cat's-ear
Eudicots	Asteraceae	***Hypochaeris radicata***	rough cat's-ear
Eudicots	Asteraceae	***Lactuca serriola***	prickly lettuce
Eudicots	Asteraceae	***Lactuca virosa***	wild lettuce
Eudicots	Asteraceae	*Layia platyglossa*	tidy-tips
Eudicots	Asteraceae	*Madia sativa*	coast tarweed
Eudicots	Asteraceae	*Matricaria discoidea*	pineapple weed
Eudicots	Asteraceae	***Pseudognaphalium luteoalbum***	weedy cudweed
Eudicots	Asteraceae	***Senecio sylvaticus***	woodland ragwort
Eudicots	Asteraceae	***Senecio vulgaris***	common groundsel

Table A-1: Plant species observed during the survey. Exotic vascular plant species shown in bold font.

Section	Family	Scientific Name	Common Name
Eudicots	Asteraceae	*Solidago velutina ssp. californica*	California goldenrod
Eudicots	Asteraceae	***Sonchus asperssp. asper***	prickly sow thistle
Eudicots	Asteraceae	***Taraxacum officinale***	common dandelion
Eudicots	Betulaceae	*Corylus cornuta ssp. californica*	California hazelnut
Eudicots	Boraginaceae	*Adelinia grande*	Pacific hound's- tongue
Eudicots	Boraginaceae	*Johnstonella micromeres*	minute-flowered cryptantha
Eudicots	Boraginaceae	***Myosotis latifolia***	broadleaved forget-me-not
Eudicots	Boraginaceae	*Plagiobothrys chorisianus var. hickmanii*	Hickman's popcornflower
Eudicots	Brassicaceae	***Brassica nigra***	black mustard
Eudicots	Brassicaceae	*Cardamine oligosperma*	popweed
Eudicots	Brassicaceae	***Lobularia maritima***	sweet alyssum
Eudicots	Brassicaceae	*Nasturtium officinale*	watercress
Eudicots	Brassicaceae	***Raphanus sativus***	radish
Eudicots	Brassicaceae	***Sisymbrium orientale***	oriental hedge mustard
Eudicots	Caprifoliaceae	*Lonicera hispidula*	hairy honeysuckle
Eudicots	Caprifoliaceae	*Symphoricarpos albus laevigatus*	snowberry
Eudicots	Caryophyllaceae	*Cardionema ramosissimum*	sand mat
Eudicots	Caryophyllaceae	*Cerastium arvense ssp. strictum*	field mouse-ear chickweed
Eudicots	Caryophyllaceae	***Silene gallica***	windmill pink
Eudicots	Caryophyllaceae	***Spergula arvensis***	stickwort, starwort
Eudicots	Caryophyllaceae	***Stellaria media***	common chickweed
Eudicots	Convolvulaceae	*Calystegia purpurata ssp. purpurata*	western morning-glory
Eudicots	Cornaceae	*Cornus sericea ssp. occidentalis*	western dogwood
Eudicots	Cornaceae	*Cornus sericea ssp. sericea*	American dogwood
Eudicots	Cucurbitaceae	*Marah fabacea*	California man-root
Eudicots	Ericaceae	*Arbutus menziesii*	Pacific madrone, madroño
Eudicots	Ericaceae	*Arctostaphylos crustacea ssp. crinita*	crinite manzanita
Eudicots	Ericaceae	*Arctostaphylos silvicola*	Bonny Doon manzanita
Eudicots	Euphorbiaceae	***Euphorbia oblongata***	oblong spurge
Eudicots	Euphorbiaceae	***Euphorbia peplus***	petty spurge
Eudicots	Fabaceae	***Acacia dealbata***	silver wattle
Eudicots	Fabaceae	***Acacia melanoxylon***	blackwood acacia
Eudicots	Fabaceae	*Acmispon glaber var. glaber*	deerweed
Eudicots	Fabaceae	***Cytisus scoparius***	Scotch broom
Eudicots	Fabaceae	***Genista monspessulana***	French broom
Eudicots	Fabaceae	***Lathyrus latifolius***	perennial sweet pea
Eudicots	Fabaceae	*Lathyrus vestitus var. vestitus*	Pacific pea

Table A-1: Plant species observed during the survey. Exotic vascular plant species shown in bold font.

Section	Family	Scientific Name	Common Name
Eudicots	Fabaceae	***Lotus corniculatus***	bird's-foot trefoil
Eudicots	Fabaceae	*Lupinus affinis*	fleshy lupine
Eudicots	Fabaceae	*Lupinus albifrons var. albifrons*	silver bush lupine
Eudicots	Fabaceae	*Lupinus arboreus*	yellow bush lupine
Eudicots	Fabaceae	*Lupinus bicolor*	miniature lupine
Eudicots	Fabaceae	*Lupinus nanus*	sky lupine
Eudicots	Fabaceae	***Medicago polymorpha***	California burclover
Eudicots	Fabaceae	***Trifolium angustifolium***	narrow-leaved clover
Eudicots	Fabaceae	***Trifolium campestre***	hop clover
Eudicots	Fabaceae	***Trifolium hirtum***	rose clover
Eudicots	Fabaceae	***Trifolium repens***	white clover
Eudicots	Fabaceae	***Trifolium subterraneum***	subterranean clover
Eudicots	Fabaceae	***Vicia sativa ssp. sativa***	spring vetch
Eudicots	Fagaceae	*Notholithocarpus densiflorus var. densiflorus*	tan oak
Eudicots	Fagaceae	*Quercus agrifolia var. agrifolia*	coast live oak, encina
Eudicots	Geraniaceae	***Erodium botrys***	long-beaked filaree
Eudicots	Geraniaceae	***Geranium dissectum***	common cranesbill
Eudicots	Geraniaceae	***Geranium molle***	soft cranesbill
Eudicots	Geraniaceae	***Geranium purpureum***	little robin
Eudicots	Hydrophyllaceae	*Nemophila parviflora var. parviflora*	small-flowered nemophila
Eudicots	Hypericaceae	***Hypericum calycinum***	Aaron's beard
Eudicots	Lamiaceae	*Clinopodium douglasii*	yerba buena
Eudicots	Lamiaceae	***Lamium amplexicaule***	henbit
Eudicots	Lamiaceae	*Stachys bullata*	California hedge nettle
Eudicots	Malvaceae	***Malva parviflora***	cheeseweed, little mallow
Eudicots	Montiaceae	*Claytonia parviflora ssp. parviflora*	small-flowered claytonia
Eudicots	Montiaceae	*Claytonia perfoliata ssp. perfoliata*	miner's lettuce
Eudicots	Myrsinaceae	**Lysimachia arvensis**	scarlet pimpernel
Eudicots	Namaceae	*Eriodictyon californicum*	California yerba santa
Eudicots	Onagraceae	*Camissonia contorta*	Contorted primrose
Eudicots	Onagraceae	*Clarkia sp.*	Clarkia
Eudicots	Onagraceae	*Epilobium ciliatum ssp. ciliatum*	willow herb
Eudicots	Oxalidaceae	***Oxalis incarnata***	crimson wood-sorrel
Eudicots	Oxalidaceae	*Oxalis oregana*	redwood sorrel
Eudicots	Oxalidaceae	***Oxalis pes-caprae***	Bermuda buttercup
Eudicots	Papaveraceae	*Dendromecon rigida*	bush poppy
Eudicots	Papaveraceae	*Eschscholzia californica*	California poppy

Table A-1: Plant species observed during the survey. Exotic vascular plant species shown in bold font.

Section	Family	Scientific Name	Common Name
Eudicots	Papaveraceae	***Fumaria parviflora***	small-flowered fumitory
Eudicots	Phrymaceae	*Diplacus aurantiacus*	sticky monkeyflower
Eudicots	Plantaginaceae	***Plantago coronopus***	cut-leaf plantain
Eudicots	Plantaginaceae	*Plantago erecta*	California plantain
Eudicots	Plantaginaceae	***Plantago lanceolata***	English plantain
Eudicots	Polemoniaceae	*Collomia heterophylla*	varied-leaved collomia
Eudicots	Polemoniaceae	*Navarretia hamata ssp. parviloba*	small-lobed navarretia
Eudicots	Polygonaceae	*Chorizanthe pungens* var. *hartwegiana*	Ben Lomond spineflower
Eudicots	Polygonaceae	***Rumex acetosella***	sheep sorrel
Eudicots	Polygonaceae	***Rumex crispus***	curly dock
Eudicots	Polygonaceae	*Rumex salicifolius*	willow-leaved dock
Eudicots	Ranunculaceae	*Ranunculus californicus var. californicus*	California buttercup
Eudicots	Rhamnaceae	*Ceanothus cuneatus var. ramulosus*	coast ceanothus
Eudicots	Rosaceae	*Adenostoma fasciculatum var. fasciculatum*	chamise
Eudicots	Rosaceae	*Fragaria vesca*	wood strawberry
Eudicots	Rosaceae	*Holodiscus discolor var. discolor*	oceanspray
Eudicots	Rosaceae	*Horkelia cuneata var. cuneata*	Kellogg's horkelia
Eudicots	Rosaceae	***Rubus armeniacus***	Himalayan blackberry
Eudicots	Rosaceae	*Rubus ursinus*	California blackberry
Eudicots	Rubiaceae	*Galium aparine*	goose grass
Eudicots	Rubiaceae	*Galium californicum & Arn. ssp. californicum*	California bedstraw
Eudicots	Salicaceae	*Populus trichocarpa*	black cottonwood
Eudicots	Rosaceae	*Rosa sp.*	rose
Eudicots	Salicaceae	*Salix laevigata Bebb*	red willow
Eudicots	Salicaceae	*Salix lasiandra var. lasiandra*	Pacific willow
Eudicots	Salicaceae	*Salix lasiolepis*	arroyo willow
Eudicots	Sapindaceae	*Acer macrophyllum*	big-leaf maple
Eudicots	Sapindaceae	*Acer negundo*	box elder
Eudicots	Sapindaceae	*Aesculus californica*	California buckeye
Eudicots	Scrophulariaceae	*Scrophularia californica*	California figwort
Eudicots	Solanaceae	*Solanum americanum*	small-flowered nightshade
Eudicots	Urticaceae	***Urtica urens***	dwarf nettle
Monocots	Agavaceae	*Chlorogalum pomeridianum var. pomeridianum*	soap plant
Monocots	Araceae	**Zantedeschia aethiopica**	calla lily
Monocots	Commelinaceae	***Tradescantia fluminensis***	small-leaf spiderwort
Monocots	Cyperaceae	*Carex globosa Boott*	round-fruited sedge
Monocots	Cyperaceae	*Carex harfordii*	Harford's sedge

Table A-1: Plant species observed during the survey. Exotic vascular plant species shown in bold font.

Section	Family	Scientific Name	Common Name
Monocots	Cyperaceae	*Carex obnupta*	slough sedge
Monocots	Cyperaceae	*Cyperus eragrostis*	umbrella sedge
Monocots	Iridaceae	*Iris douglasiana*	Douglas's iris
Monocots	Iridaceae	*Sisyrinchium bellum*	western blue-eyed grass
Monocots	Juncaceae	*Juncus effusus ssp. pacificus*	Pacific rush
Monocots	Juncaceae	*Juncus patens*	common rush, spreading rush
Monocots	Juncaceae	*Juncus phaeocephalus var. paniculatus*	brown-headed rush
Monocots	Liliaceae	*Prosartes hookeri*	Hooker's fairy bells
Monocots	Melanthiaceae	*Trillium ovatum ssp. ovatum*	western trillium
Monocots	Poaceae	***Aira caryophyllea***	silver hair grass
Monocots	Poaceae	***Avena barbata***	slender wild oat
Monocots	Poaceae	***Briza maxima***	rattlesnake grass
Monocots	Poaceae	***Briza minor***	small quaking grass
Monocots	Poaceae	***Bromus catharticus var. catharticus***	rescue grass
Monocots	Poaceae	***Bromus diandrus***	ripgut brome
Monocots	Poaceae	***Bromus hordeaceus***	soft chess
Monocots	Poaceae	*Bromus sitchensis var. carinatus*	California brome
Monocots	Poaceae	*Calamagrostis rubescens*	pine reed grass
Monocots	Poaceae	***Cynosurus echinatus***	bristly dogtail grass
Monocots	Poaceae	*Danthonia californica*	California oat grass
Monocots	Poaceae	***Ehrharta erecta***	panic veldt grass
Monocots	Poaceae	*Elymus glaucus ssp. glaucus*	blue wild-rye
Monocots	Poaceae	*Festuca californica*	California fescue
Monocots	Poaceae	***Festuca myuros***	rattail fescue
Monocots	Poaceae	***Festuca perennis***	Italian rye grass
Monocots	Poaceae	*Festuca rubra*	red fescue
Monocots	Poaceae	***Holcus lanatus***	velvet grass
Monocots	Poaceae	***Hordeum murinum ssp. leporinum***	farmer's foxtail, hare barley
Monocots	Poaceae	*Melica imperfecta*	small-flowered melic
Monocots	Poaceae	*Stipa pulchra*	purple needle grass
Monocots	Ruscaceae	*Maianthemum racemosum*	false Solomon's seal
Monocots	Ruscaceae	*Maianthemum stellatum*	slim Solomon's seal
Monocots	Typhaceae	*Typha* sp.	cattail

Appendix B: Individual Rare Plant Patch Data

This appendix provides the data collected for the patches (one or more) of rare plants, which are mapped in Figures 2-1 through 2-5 and summarized in Table 3.

Table B-1: Individual patch data for rare plants mapped as part of the survey

Patch	Geometry Type	Species	Patch Area (Square Feet)	Number of Plants			
				Seedlings	Juveniles	Adults	Total
1	Points	*Arctostaphylos silvicola*	1	0	1	0	1
2	Points	*Chorizanthe pungens* var. *hartwegiana*	3	0	0	150	150
3	Points	*Chorizanthe pungens* var. *hartwegiana*	0.02	0	0	3	3
4	Point	*Chorizanthe pungens* var. *hartwegiana*	0.01	0	0	1	1
5	Point	*Arctostaphylos silvicola*	4	0	1	0	1
6	Point	*Chorizanthe pungens* var. *hartwegiana*	2.5	0	0	67	67
7	Point	*Arctostaphylos silvicola*	0.88	2	3	0	5
8	Point	*Chorizanthe pungens* var. *hartwegiana*	1.25	0	0	6	6
9	Point	*Arctostaphylos silvicola*	3	0	1	0	1
10	Point	*Arctostaphylos silvicola*	12	0	0	1	1
11	Point	*Arctostaphylos silvicola*	0.21	0	1	0	1
12	Point	*Chorizanthe pungens* var. *hartwegiana*	2	0	0	53	53
13	Polygon	*Arctostaphylos silvicola*	164	0	0	3	3
14	Polygon	*Arctostaphylos silvicola*	395	0	1	4	5
15	Polygon	*Arctostaphylos silvicola*	8	0	0	1	1
16	Polygon	*Arctostaphylos silvicola*	257	0	0	4	4
17	Polygon	*Arctostaphylos silvicola*	87	0	0	1	1
18	Polygon	*Arctostaphylos silvicola*	1,907	0	0	11	11
19	Polygon	*Arctostaphylos silvicola*	2,073	0	0	15	15
20	Polygon	*Arctostaphylos silvicola*	74	0	0	3	3
21	Polygon	*Arctostaphylos silvicola*	290	0	0	4	4
22	Polygon	*Arctostaphylos silvicola*	481	0	0	4	4
23	Polygon	*Arctostaphylos silvicola*	331	0	0	6	6
24	Polygon	*Arctostaphylos silvicola*	941	0	0	4	4
25	Polygon	*Arctostaphylos silvicola*	64	0	0	2	2
26	Polygon	*Arctostaphylos silvicola*	558	0	0	5	5
27	Polygon	*Arctostaphylos silvicola*	363	0	0	2	2
28	Polygon	*Arctostaphylos silvicola*	85	0	0	1	1
29	Polygon	*Arctostaphylos silvicola*	946	0	1	7	8
30	Polygon	*Arctostaphylos silvicola*	980	0	0	6	6
31	Polygon	*Arctostaphylos silvicola*	68	0	0	2	2

Table B-1: Individual patch data for rare plants mapped as part of the survey

Patch	Geometry Type	Species	Patch Area (Square Feet)	Number of Plants			
				Seedlings	Juveniles	Adults	Total
32	Polygon	*Arctostaphylos silvicola*	4	0	0	1	1
33	Polygon	*Arctostaphylos silvicola*	536	0	0	7	7
34	Polygon	*Chorizanthe pungens* var. *hartwegiana*	146	0	0	470	470
35	Polygon	*Chorizanthe pungens* var. *hartwegiana*	34	0	0	76	76
36	Polygon	*Arctostaphylos silvicola*	5.7	0	0	1	1
37	Polygon	*Arctostaphylos silvicola*	2,132	0	0	9	9
38	Polygon	*Arctostaphylos silvicola*	122	0	0	1	1
39	Polygon	*Chorizanthe pungens* var. *hartwegiana*	84	0	0	446	446
40	Polygon	*Chorizanthe pungens* var. *hartwegiana*	22	0	0	48	48
41	Polygon	*Arctostaphylos silvicola*	64	0	1	0	1
42	Polygon	*Arctostaphylos silvicola*	403	0	0	8	8

Appendix D
Plant Compendium

Vascular Species

Eudicots

ADOXACEAE—Muskroot Family
- Sambucus nigra—blue elderberry
- Sambucus racemosa—red elderberry

ANACARDIACEAE—Sumac Or Cashew Family
- Toxicodendron diversilobum—poison oak

APIACEAE—Carrot Family
- Conium maculatum—poison hemlock*
- Heracleum maximum—common cowparsnip
- Sanicula crassicaulis—Pacific blacksnakeroot

APOCYNACEAE—Dogbane Family
- Vinca major—bigleaf periwinkle*

ARALIACEAE—Ginseng Family
- Hedera helix—English ivy*

ARISTOLOCHIACEAE—Pipevine Family
- Asarum caudatum—British Columbia wildginger

ASTERACEAE—Sunflower Family
- Adenocaulon bicolor—American trailplant
- Artemisia californica—California sagebrush
- Artemisia douglasiana—Douglas' sagewort
- Artemisia ludoviciana—white sagebrush
- Baccharis pilularis—coyote brush
- Centaurea solstitialis—yellow star-thistle*
- Cirsium vulgare—bull thistle*
- Ericameria ericoides—mock heather
- Erigeron bonariensis—asthmaweed*
- Eriophyllum confertiflorum—golden-yarrow
- Helminthotheca echioides—bristly oxtongue*

BETULACEAE—Birch Family
- Alnus rhombifolia—white alder
- Alnus rubra—red alder
- Corylus cornuta—beaked hazelnut

BORAGINACEAE—Borage Family
- Eriodictyon californicum—California yerba santa
- Myosotis latifolia—broadleaf forget-me-not*
- Phacelia californica—California phacelia

BRASSICACEAE—Mustard Family
- Hirschfeldia incana—shortpod mustard*

CAPRIFOLIACEAE—Honeysuckle Family
- Lonicera hispidula—pink honeysuckle
- Symphoricarpos albus—common snowberry

CONVOLVULACEAE—Morning-glory Family
- Calystegia purpurata—Pacific false bindweed
- Convolvulus arvensis—field bindweed*

CORNACEAE—Dogwood Family
- Cornus sericea ssp. sericea—redosier dogwood

CUCURBITACEAE—Gourd Family
- Cucumis anguria—West Indian gherkin*
- Marah fabacea—California man-root

ERICACEAE—Heath Family
- Arbutus menziesii—madrone
- Arctostaphylos columbiana—hairy manzanita
- Arctostaphylos pungens—pointleaf manzanita
- Arctostaphylos silvicola—Bonny Doon manzanita
- Arctostaphylos tomentosa—woolly leaf manzanita
- Vaccinium ovatum—California huckleberry

FABACEAE—Legume Family
- Acacia dealbata—silver wattle*
- Acacia melanoxylon—blackwood*
- Acmispon glaber—deer weed
- Cytisus scoparius—broom*
- Genista monspessulana—French broom*
- Lupinus albifrons—silver bush lupine
- Robinia pseudoacacia—black locust*
- Vicia sativa—garden vetch*

FAGACEAE—Oak Family
- Notholithocarpus densiflorus—tanoak
- Quercus agrifolia—coast live oak
- Quercus lobata—valley oak
- Quercus parvula var. shrevei—Shreve oak

GARRYACEAE—Silk Tassel Family
- Garrya elliptica—coastal silk tassel

GROSSULARIACEAE—Gooseberry Family
- Ribes divaricatum var. pubiflorum—straggly gooseberry
- Ribes menziesii var. menziesii—canyon gooseberry

LAMIACEAE—Mint Family
- Salvia mellifera—black sage
- Stachys ajugoides—bugle hedgenettle

LAURACEAE—Laurel Family
- Umbellularia californica—California bay

MYRTACEAE—Myrtle Family
- Eucalyptus globulus—Tasmanian bluegum*

OXALIDACEAE—Oxalis Family
- Oxalis oregana—redwood-sorrel

PAPAVERACEAE—Poppy Family

Eschscholzia californica—California poppy
PHRYMACEAE—Lopseed Family
Diplacus aurantiacus—bush monkeyflower
PLANTAGINACEAE—Plantain Family
Plantago lanceolata—narrowleaf plantain*
PLATANACEAE—Plane Tree, Sycamore Family
Platanus racemosa—California sycamore
POLYGONACEAE—Buckwheat Family
Eriogonum fasciculatum—California buckwheat
Eriogonum nudum—naked buckwheat
Rumex acetosella—common sheep sorrel*
Rumex crispus—curly dock*
RANUNCULACEAE—Buttercup Family
Clematis vitalba—evergreen clematis*
RHAMNACEAE—Buckthorn Family
Ceanothus cuneatus—wedge leaf ceanothus, buck brush
Ceanothus incanus—coast whitethorn
Frangula californica—California coffee berry
ROSACEAE—Rose Family
Adenostoma fasciculatum—chamise
Cercocarpus betuloides—birch leaf mountain mahogany
Cotoneaster pannosus—silverleaf cotoneaster*
Heteromeles arbutifolia—toyon
Holodiscus discolor—ocean spray brush
Pyracantha coccinea—scarlet firethorn*
Rosa gymnocarpa—dwarf rose
Rubus armeniacus—Himalayan blackberry*
Rubus parviflorus—thimbleberry
Rubus ursinus—California blackberry
SALICACEAE—Willow Family
Populus fremontii—Fremont cottonwood
Populus trichocarpa—black cottonwood
Salix lasiandra var. lasiandra—Shining willow
Salix lasiolepis—arroyo willow
SAPINDACEAE—Soapberry Family
Acer macrophyllum—bigleaf maple
Acer negundo—box-elder
Aesculus californica—California buckeye
VERBENACEAE—Vervain Family
Verbena lasiostachys—western vervain
VIOLACEAE—Violet Family
Viola sempervirens—evergreen violet

Ferns and Fern Allies

BLECHNACEAE—Deer Fern Family
- Woodwardia fimbriata—giant chainfern

DENNSTAEDTIACEAE—Bracken Family
- Pteridium aquilinum var. pubescens—hairy brackenfern

DRYOPTERIDACEAE—Wood Fern Family
- Dryopteris arguta—coastal woodfern
- Polystichum californicum—California swordfern
- Polystichum munitum—western swordfern

EQUISETACEAE—Horsetail Family
- Equisetum hyemale ssp. affine—scouringrush horsetail

POLYPODIACEAE—Polypody Family
- Polypodium californicum—California polypody

PTERIDACEAE—Brake Family
- Adiantum jordanii—California maidenhair
- Pellaea andromedifolia—coffee cliffbrake
- Pellaea mucronata—birdfoot cliffbrake
- Pentagramma triangularis—goldback fern

WOODSIACEAE—Cliff Fern Family
- Athyrium filix-femina var. cyclosorum—subarctic ladyfern

Gymnosperms and Gnetophytes

CUPRESSACEAE—Cypress Family
- Hesperocyparis macrocarpa—Monterey cypress
- Sequoia sempervirens—redwood

PINACEAE—Pine Family
- Pinus attenuata—knobcone pine
- Pinus ponderosa var. pacifica—Pacific ponderosa pine
- Pinus radiata—Monterey pine
- Pseudotsuga menziesii—Douglas fir

Monocots

CYPERACEAE—Sedge Family
- Cyperus eragrostis—tall flatsedge

IRIDACEAE—Iris Family
- Iris douglasiana—Douglas iris

MELANTHIACEAE—False Hellebore Family
- Trillium chloropetalum—giant wakerobin

ORCHIDACEAE—Orchid Family
- Epipactis helleborine—broadleaf helleborine*

POACEAE—Grass Family
- Briza maxima—big quakinggrass*
- Melica imperfecta—smallflower melicgrass

* signifies introduced (non-native) species

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Appendix E

Wildlife Compendium

Vertebrates

Amphibians

HYLIDAE—TREEFROGS
Pseudacris sierra—Sierran treefrog

Birds

TYRANNIDAE—TYRANT FLYCATCHERS
Sayornis nigricans—black phoebe
TROCHILIDAE—HUMMINGBIRDS
Calypte anna—Anna's hummingbird
REGULIDAE—KINGLETS
Regulus calendula—ruby-crowned kinglet
ODONTOPHORIDAE—NEW WORLD QUAIL
Callipepla californica—California quail
COLUMBIDAE—PIGEONS & DOVES
Zenaida macroura—mourning dove
TURDIDAE—THRUSHES
Catharus guttatus—hermit thrush
Turdus migratorius—American robin
PARULIDAE—WOOD-WARBLERS
Setophaga coronata—yellow-rumped warbler
TROGLODYTIDAE—WRENS
Thryomanes bewickii—Bewick's wren
ACCIPITRIDAE—HAWKS, KITES, EAGLES, & ALLIES
Accipiter striatus—sharp-shinned hawk
Buteo jamaicensis—red-tailed hawk
Buteo lineatus—red-shouldered hawk
AEGITHALIDAE—LONG-TAILED TITS & BUSHTITS
Psaltriparus minimus—bushtit
ANATIDAE—DUCKS, GEESE, & SWANS
Aix sponsa—wood duck
Bucephala clangula—common goldeneye
Lophodytes cucullatus—hooded merganser
CORVIDAE—CROWS & JAYS
Aphelocoma californica—California scrub-jay
Corvus brachyrhynchos—American crow
Corvus corax—common raven
Cyanocitta stelleri—Steller's jay
PARIDAE—CHICKADEES & TITMICE
Poecile rufescens—chestnut-backed chickadee
PICIDAE—WOODPECKERS & ALLIES

Dryocopus pileatus—pileated woodpecker
Melanerpes formicivorus—acorn woodpecker
Dryobates nuttallii—Nuttall's woodpecker
Dryobates pubescens—downy woodpecker

PASSERELLIDAE—NEW WORLD SPARROWS

Junco hyemalis—dark-eyed junco
Melozone crissalis—California towhee
Pipilo maculatus—spotted towhee
Zonotrichia atricapilla—golden-crowned sparrow

CATHARTIDAE—NEW WORLD VULTURES

Cathartes aura—turkey vulture

Mammals

CANIDAE—WOLVES & FOXES

Canis latrans—coyote
Canis lupus familiaris—domestic dog*

EQUIDAE—HORSES & BURROS

Equus caballus—domestic horse*

CERVIDAE—DEERS

Odocoileus hemionus—mule deer

SCIURIDAE—SQUIRRELS

Sciurus griseus—western gray squirrel

CRICETIDAE—RATS, MICE, & VOLES

Neotoma fuscipes—dusky-footed woodrat

* signifies introduced (non-native) species

Appendix F

Special-Status Plant Species Potentially Occurring within the Biological Study Area

Scientific Name	Common Name	Status Federal/State/ CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (feet amsl)	Potential to Occur
Agrostis blasdalei	Blasdale's bent grass	None/None/1B.2	Coastal bluff scrub, Coastal dunes, Coastal prairie/perennial rhizomatous herb/May–July/0–490	Not expected to occur. Suitable coastal bluff habitat for this species is absent from the BSA.
Amsinckia lunaris	bent-flowered fiddleneck	None/None/1B.2	Coastal bluff scrub, Cismontane woodland, Valley and foothill grassland/annual herb/Mar–June/10–1,640	Low potential to occur. Marginally suitable grassland habitat is present within the BSA, but most has been eliminated by intensive human use. The closest CNDDB occurrence was documented approximately 2.3 miles southwest of the BSA in 1990 (CDFW 2021; No. 1).
Arctostaphylos andersonii	Anderson's manzanita	None/None/1B.2	Broadleafed upland forest, Chaparral, North Coast coniferous forest; openings, edges/perennial evergreen shrub/Nov–May/197–2,490	Moderate potential to occur. The BSA supports marginally suitable habitat for this species and the CNDDB lists 127 occurrences throughout the Santa Cruz Mountains (CDFW 2021).
Arctostaphylos glutinosa	Schreiber's manzanita	None/None/1B.2	Closed-cone coniferous forest, Chaparral; diatomaceous shale/perennial evergreen shrub/(Nov)Mar–Apr/558–2,245	Not expected to occur. The BSA is outside the known distribution of this species.
Arctostaphylos ohloneana	Ohlone manzanita	None/None/1B.1	Closed-cone coniferous forest, Coastal scrub; siliceous shale/evergreen shrub/Feb–Mar/1,475–1,735	Not expected to occur. The BSA is outside of the species' known elevation range.
Arctostaphylos pajaroensis	Pajaro manzanita	None/None/1B.1	Chaparral (sandy)/perennial evergreen shrub/Dec–Mar/98–2,490	Not expected to occur. The BSA is outside the known distribution of this species.
Arctostaphylos regismontana	Kings Mountain manzanita	None/None/1B.2	Broadleafed upland forest, Chaparral, North Coast coniferous forest; granitic or sandstone/perennial evergreen shrub/Dec–Apr/1,000–2,395	Not expected to occur. The BSA is outside of the species' known elevation range.
Eriogonum nudum var. decurrens	Ben Lomond buckwheat	None/None/1B.1	Chaparral, Cismontane woodland, Lower montane coniferous forest (maritime ponderosa pine sandhills); sandy/perennial herb/June–Oct/164–2,620	Observed. This species was observed in the Newell Creek Road and Graham Hill Road North sections of the BSA. Suitable sandhills are present within the Glen Arbor Road, Quail Hollow Road, and Mount Hermon Road sections of the BSA. The closest CNDDB occurrence was documented within the 0.1 mile south of the BSA in 2017 (CDFW 2021; No. 1).
Arenaria paludicola	marsh sandwort	FE/SE/1B.1	Marshes and swamps (freshwater or brackish); sandy, openings/perennial stoloniferous herb/May–Aug/10–560	Low potential to occur. The BSA supports suitable habitat for this species in Wilder Ranch State Park located approximately 3.9 miles southwest of the study area, where this species was introduced back into native habitat in 2013 (CDFW 2021).

Scientific Name	Common Name	Status Federal/State/ CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (feet amsl)	Potential to Occur
Calyptridium parryi var. hesseae	Santa Cruz Mountains pussypaws	None/None/1B.1	Chaparral, Cismontane woodland; sandy or gravelly, openings/annual herb/May–Aug/1,000–5,015	Low potential to occur. Although the BSA is outside of the species' known elevation range, there is marginally suitable habitat within the BSA and the nearest CNDDB occurrence was documented within 0.5 mile south of the BSA (CDFW 2021; No. 13).
Campanula californica	swamp harebell	None/None/1B.2	Bogs and fens, Closed-cone coniferous forest, Coastal prairie, Meadows and seeps, Marshes and swamps (freshwater), North Coast coniferous forest; mesic/perennial rhizomatous herb/June–Oct/3–1,325	Low potential to occur. The BSA supports suitable habitat for this species. However, only one historic occurrence of this species was documented within the region. This species was documented in a bog near Camp Evers in 1944. This occurrence has since been extirpated (CDFW 2020; No. 1).
Carex comosa	bristly sedge	None/None/2B.1	Coastal prairie, Marshes and swamps (lake margins), Valley and foothill grassland/perennial rhizomatous herb/May–Sep/0–2,050	Low potential to occur. The BSA supports suitable habitat for this species. However, only two historic occurrences of this species were documented within the region. This species was documented within the Bonny Doon Ecological Preserve in 2007 approximately 3.3 miles east of the BSA and in the Forest of Nisene Marks State Park in 1994 approximately 7.9 miles west of the BSA (CDFW 2020; No. 32 and 2).
Carex saliniformis	deceiving sedge	None/None/1B.2	Coastal prairie, Coastal scrub, Meadows and seeps, Marshes and swamps (coastal salt); mesic/perennial rhizomatous herb/June(July)/10–755	Moderate potential to occur. The BSA supports suitable habitat for this species, although modern and historical CNDDB occurrences are scarce.
Centromadia parryi ssp. congdonii	Congdon's tarplant	None/None/1B.1	Valley and foothill grassland (alkaline)/annual herb/May–Oct(Nov)/0–755	Not expected to occur. The BSA is outside the known distribution of this species.
Chorizanthe pungens var. hartwegiana	Ben Lomond spineflower	FE/None/1B.1	Lower montane coniferous forest (maritime ponderosa pine sandhills)/annual herb/Apr–July/295–2,000	Observed. This species was observed in the Graham Hill Road North section of the BSA. Suitable forest habitat and sandhill soils are present within all portions of the BSA, except for the Graham Hill Road South section. The closest CNDDB occurrence was documented approximately 20 feet southwest of the BSA in 1988 (CDFW 2020; No. 3).

Scientific Name	Common Name	Status Federal/State/ CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (feet amsl)	Potential to Occur
Chorizanthe pungens var. pungens	Monterey spineflower	FT/None/1B.2	Chaparral (maritime), Cismontane woodland, Coastal dunes, Coastal scrub, Valley and foothill grassland; sandy/annual herb/Apr–June(July–Aug)/10–1,475	Not expected to occur. Although there are a couple CNDDB occurrences for this species within Santa Cruz County, they are from 2006 and located in the most southern portion of the County. The BSA is outside the known distribution of this species.
Chorizanthe robusta var. hartwegii	Scotts Valley spineflower	FE/None/1B.1	Meadows and seeps (sandy), Valley and foothill grassland (mudstone and Purisima outcrops)/annual herb/Apr–July/755–805	Not expected to occur. Although there are a couple CNDDB occurrences for this species within Santa Cruz County, the species is endemic to grasslands within the Scotts Valley region southeast of the BSA.
Horkelia cuneata var. sericea	Kellogg's horkelia	None/None/1B.1	Closed-cone coniferous forest, Chaparral (maritime), Coastal dunes, Coastal scrub; sandy or gravelly, openings/perennial herb/Apr–Sep/33–655	Moderate potential to occur. The BSA supports suitable habitat for this species, although only historic CNDDB occurrences occur within the region (CDFW 2021).
Cirsium fontinale var. campylon	Mt. Hamilton thistle	None/None/1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland; serpentinite seeps/perennial herb/(Feb)Apr–Oct/328–2,915	Not expected to occur. There are no occurrences of this species within Santa Cruz County.
Collinsia multicolor	San Francisco collinsia	None/None/1B.2	Closed-cone coniferous forest, Coastal scrub; sometimes serpentinite/annual herb/(Feb)Mar–May/98–902	Not expected to occur. The biological study is outside the known distribution of this species.
Horkelia marinensis	Point Reyes horkelia	None/None/1B.2	Coastal dunes, Coastal prairie, Coastal scrub; sandy/perennial herb/May–Sep/16–2,475	Moderate potential to occur. The BSA supports suitable habitat for this species. The CNDDB lists two occurrences in the vicinity of UCSC (CDFW 2021).
Dudleya abramsii ssp. setchellii	Santa Clara Valley dudleya	FE/None/1B.1	Cismontane woodland, Valley and foothill grassland; serpentinite, rocky/perennial herb/Apr–Oct/197–1,755	Not expected to occur. There are no occurrences of this species within Santa Cruz County.
Arctostaphylos silvicola	Bonny Doon manzanita	None/None/1B.2	Closed-cone coniferous forest, Chaparral, Lower montane coniferous forest; inland marine sands/perennial evergreen shrub/Jan–Mar/394–1,965	Observed. Suitable forest and shrub habitat is present within the BSA. The species was observed along the right-of-way during the 2021 habitat assessment. The closest CNDDB occurrence was documented within chaparral/sandhill habitat approximately 0.06 mile southwest of the BSA in 2014 (CDFW 2020; No. 1).
Chorizanthe robusta var. robusta	robust spineflower	FE/None/1B.1	Chaparral (maritime), Cismontane woodland (openings), Coastal dunes, Coastal scrub; sandy or gravelly/annual herb/Apr–Sep/10–985	Moderate potential to occur. The BSA supports suitable habitat for this species and the CNDDB lists 8 occurrences within the region (CDFW 2021).

Scientific Name	Common Name	Status Federal/State/ CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (feet amsl)	Potential to Occur
Plagiobothrys chorisianus var. chorisianus	Choris' popcornflower	None/None/1B.2	Chaparral, Coastal prairie, Coastal scrub; mesic/annual herb/Mar–June/10–525	High potential to occur. The BSA supports suitable habitat for this species, and the CNDDB lists five occurrences, modern and historic, within wetlands from Boulder Creek to Scotts Valley (CDFW 2021).
Fritillaria liliacea	fragrant fritillary	None/None/1B.2	Cismontane woodland, Coastal prairie, Coastal scrub, Valley and foothill grassland; Often serpentinite/perennial bulbiferous herb/Feb–Apr/10–1,345	Not expected to occur. There are no occurrences of this species within Santa Cruz County.
Grimmia torenii	Toren's grimmia	None/None/1B.3	Chaparral, Cismontane woodland, Lower montane coniferous forest; Openings, rocky, boulder and rock walls, carbonate, volcanic/moss/N.A./1,065–3,805	Not expected to occur. The BSA is outside of the species' known elevation range.
Grimmia vaginulata	vaginulate grimmia	None/None/1B.1	Chaparral (openings); Rocky, boulder and rock walls, carbonate/moss/N.A./2,245–2,245	Not expected to occur. The BSA is outside of the species' known elevation range.
Hesperevax sparsiflora var. brevifolia	short-leaved evax	None/None/1B.2	Coastal bluff scrub (sandy), Coastal dunes, Coastal prairie/annual herb/Mar–June/0–705	Low potential to occur. Although The BSA supports suitable habitat for this species, the only occurrence lists by the CNDDB is historic and lacks locational information (CDFW 2020; No. 1).
Hesperocyparis abramsiana var. abramsiana	Santa Cruz cypress	FT/SE/1B.2	Closed-cone coniferous forest, Chaparral, Lower montane coniferous forest; sandstone or granitic/perennial evergreen tree/N.A./919–2,620	Not expected to occur. The BSA is outside of the species' known elevation range.
Hesperocyparis abramsiana var. butanoensis	Butano Ridge cypress	FT/SE/1B.2	Closed-cone coniferous forest, Chaparral, Lower montane coniferous forest; Sandstone/perennial evergreen tree/Oct/1,310–1,605	Not expected to occur. The BSA is outside of the species' known elevation range.
Hoita strobilina	Loma Prieta hoita	None/None/1B.1	Chaparral, Cismontane woodland, Riparian woodland; usually serpentinite, mesic/perennial herb/May–July(Aug–Oct)/98–2,820	Not expected to occur. There are no occurrences of this species within Santa Cruz County.
Fissidens pauperculus	minute pocket moss	None/None/1B.2	North Coast coniferous forest (damp coastal soil)/moss/N.A./33–3,355	High potential to occur. The BSA supports suitable habitat for this species and the CNDDB lists two occurrences within Santa Cruz County (CDFW 2021). The closest CNDDB occurrence was documented approximately 1.3 miles east of the BSA near the Felton Diversion in 2001 (CDFW 2021; No.11).

Scientific Name	Common Name	Status Federal/State/ CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (feet amsl)	Potential to Occur
Erysimum menziesii	Menzies' wallflower	FE/SE/1B.1	Coastal dunes/perennial herb/Mar–September/0–115	Not expected to occur. Suitable coastal dune habitat for this species is absent from the BSA. There are no CNDDB occurrences of this species within 10 miles of the BSA.
Erysimum teretifolium	Santa Cruz wallflower	FE/SE/1B.1	Chaparral, Lower montane coniferous forest; inland marine sands/perennial herb/Mar–July/394–2,000	Moderate potential to occur. This species was documented south of the Mt. Hernon Road exit along La Madrona Road in 1995 (CDFW 2020, No. 29) and suitable coniferous forest habitat is present within the study area. The remainder of the BSA is below the elevational range of the species.
Dacryophyllum falcifolium	tear drop moss	None/None/1B.3	North Coast coniferous forest; carbonate/moss/N.A./164–900	Moderate potential to occur. The BSA supports marginally suitable habitat for this species. The closest CNDDB occurrence was documented approximately 1.1 mile east of the BSA near Felton Diversion in 2013 (CDFW 2020; No. 7).
Lasthenia californica ssp. macrantha	perennial goldfields	None/None/1B.2	Coastal bluff scrub, Coastal dunes, Coastal scrub/perennial herb/Jan–Nov/16–1,705	Not expected to occur. Suitable coastal habitat for this species is absent from the study area.The historic distribution of this species is limited to Seacliff State Park (CDFW 2021).
Lessingia micradenia var. glabrata	smooth lessingia	None/None/1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland; serpentinite, often roadsides/annual herb/(Apr–June)July–Nov/394–1,375	Not expected to occur. There are no occurrences of this species within Santa Cruz County.
Malacothamnus arcuatus	arcuate bush-mallow	None/None/1B.2	Chaparral, Cismontane woodland/perennial evergreen shrub/Apr–Sep/49–1,160	Low potential to occur. The BSA supports suitable habitat for this species. However, CNDDB occurrences are limited to the northern and easternmost limits of Santa Cruz County (CDFW 2021).
Microseris paludosa	marsh microseris	None/None/1B.2	Closed-cone coniferous forest, Cismontane woodland, Coastal scrub, Valley and foothill grassland/perennial herb/Apr–June(July)/16–1,160	Not expected to occur. The BSA supports marginally suitable habitat for this species. However, the three CNDDB occurrences within Santa Cruz County are historic and/or lack specific locational information (CDFW 2021). These occurrences are assumed extirpated.

Scientific Name	Common Name	Status Federal/State/ CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (feet amsl)	Potential to Occur
Monardella sinuata ssp. nigrescens	northern curly-leaved monardella	None/None/1B.2	Chaparral (SCR Co.), Coastal dunes, Coastal scrub, Lower montane coniferous forest (SCR Co., ponderosa pine sandhills); Sandy./annual herb/(Apr)May–July(Aug–Sep)/0–985	High potential to occur. Marginally suitable to suitable scrub, woodland, grassland, and/or Ponderosa pine sandhill habitat is present within the BSA. The closest CNDDB occurrence was documented immediately to the northeast of the BSA in 1993 (CDFW 2021; No. 11).
Plagiobothrys diffusus	San Francisco popcornflower	None/SE/1B.1	Coastal prairie, Valley and foothill grassland/annual herb/Mar–June/197–1,180	High potential to occur. The BSA supports suitable habitat for this species, and the CNDDB lists 19 occurrences, modern and historic, within the vicinity of Santa Cruz (CDFW 2021).
Orthotrichum kellmanii	Kellman's bristle moss	None/None/1B.2	Chaparral, Cismontane woodland; sandstone, carbonate/moss/Jan–Feb/1,125–2,245	Not expected to occur. The BSA is outside of the species' known elevation range.
Pedicularis dudleyi	Dudley's lousewort	None/SR/1B.2	Chaparral (maritime), Cismontane woodland, North Coast coniferous forest, Valley and foothill grassland/perennial herb/Apr–June/197–2,950	Low potential to occur. The BSA supports suitable habitat for this species. However, the two CNDDB occurrences documented within Santa Cruz County are over 100 years old (CDFW 2021).
Penstemon rattanii var. kleei	Santa Cruz Mountains beardtongue	None/None/1B.2	Chaparral, Lower montane coniferous forest, North Coast coniferous forest/perennial herb/May–June/1,310–3,605	Not expected to occur. The BSA is outside of the species' known elevation range.
Pentachaeta bellidiflora	white-rayed pentachaeta	FE/SE/1B.1	Cismontane woodland, Valley and foothill grassland (often serpentinite)/annual herb/Mar–May/115–2,030	Not expected to occur. The BSA supports suitable habitat for this species. However, the last CNDDB occurrence was from 1955 and the species is presumed extirpated (CDFW 2021; Neubauer 2013).
Pinus radiata	Monterey pine	None/None/1B.1	Closed-cone coniferous forest, Cismontane woodland/perennial evergreen tree/N.A./82–605	Not expected to occur. The current range of this species is limited to three stands, the northernmost of which is located east of point Año Nuevo, outside of The BSA.
Piperia candida	white-flowered rein orchid	None/None/1B.2	Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest; sometimes serpentinite/perennial herb/(Mar)May–Sep/98–4,295	Low potential to occur. The BSA supports marginally suitable habitat for this species. However, the only CNDDB occurrence within the region is located approximately 3.5 miles southeast of the BSA from 1966 (CDFW 2021; No. 2).
Holocarpha macradenia	Santa Cruz tarplant	FT/SE/1B.1	Coastal prairie, Coastal scrub, Valley and foothill grassland; often clay, sandy/annual herb/June–Oct/33–720	High potential to occur. The BSA supports suitable habitat for this species, and the CNDDB lists 14 occurrences documented in the vicinity of Santa Cruz and Aptos (CDFW 2021).

Scientific Name	Common Name	Status Federal/State/ CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (feet amsl)	Potential to Occur
Monolopia gracilens	woodland woolythreads	None/None/1B.2	Broadleafed upland forest (openings), Chaparral (openings), Cismontane woodland, North Coast coniferous forest (openings), Valley and foothill grassland; Serpentine/annual herb/(Feb)Mar–July/328–3,935	High potential to occur. The BSA supports suitable habitat for this species and the CNDDB lists 31 occurrences throughout Santa Cruz County (CDFW 2021).
Plagiobothrys glaber	hairless popcornflower	None/None/1A	Meadows and seeps (alkaline), Marshes and swamps (coastal salt)/annual herb/Mar–May/49–590	Not expected to occur. There are no occurrences of this species within Santa Cruz County.
Polygonum hickmanii	Scotts Valley polygonum	FE/SE/1B.1	Valley and foothill grassland (mudstone and sandstone)/annual herb/May–Aug/689–820	Not expected to occur. Although there are a couple CNDDB occurrences for this species within Santa Cruz County, the species is endemic to grasslands within the Scotts Valley region southeast of the BSA.
Sanicula saxatilis	rock sanicle	None/SR/1B.2	Broadleafed upland forest, Chaparral, Valley and foothill grassland; rocky, scree, talus/perennial herb/Apr–May/2,030–3,850	Not expected to occur. The BSA is outside of the species' known elevation range.
Senecio aphanactis	chaparral ragwort	None/None/2B.2	Chaparral, Cismontane woodland, Coastal scrub; sometimes alkaline/annual herb/Jan–Apr(May)/49–2,620	Not expected to occur. The BSA is outside the known distribution of this species.
Silene verecunda ssp. verecunda	San Francisco campion	None/None/1B.2	Coastal bluff scrub, Chaparral, Coastal prairie, Coastal scrub, Valley and foothill grassland; sandy/perennial herb/(Feb)Mar–June(Aug)/98–2,115	Low potential to occur. The BSA supports marginally suitable habitat for this species, although only historic CNDDB occurrences from 1983 occur within the region approximately 9.5 miles east of the BSA (CDFW 2021).
Stebbinsoseris decipiens	Santa Cruz microseris	None/None/1B.2	Broadleafed upland forest, Closed-cone coniferous forest, Chaparral, Coastal prairie, Coastal scrub, Valley and foothill grassland; open areas, sometimes serpentinite/annual herb/Apr–May/33–1,640	Not expected to occur. The BSA is outside the known distribution of this species.
Streptanthus albidus ssp. albidus	Metcalf Canyon jewelflower	FE/None/1B.1	Valley and foothill grassland (serpentinite)/annual herb/Apr–July/148–2,620	Not expected to occur. There are no occurrences of this species within Santa Cruz County.
Streptanthus albidus ssp. peramoenus	most beautiful jewelflower	None/None/1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland; serpentinite/annual herb/(Mar)Apr–Sep(Oct)/312–3,280	Not expected to occur. There are no occurrences of this species within Santa Cruz County.
Trifolium buckwestiorum	Santa Cruz clover	None/None/1B.1	Broadleafed upland forest, Cismontane woodland, Coastal prairie; gravelly, margins/annual herb/Apr–Oct/344–2,000	Low potential to occur. The BSA supports marginally suitable habitat for this species. The CNDDB lists several occurrences from the vicinity of Boulder Creek down to Santa Cruz (CDFW 2021).

Scientific Name	Common Name	Status Federal/State/ CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (feet amsl)	Potential to Occur
Trifolium polyodon	Pacific Grove clover	None/SR/1B.1	Closed-cone coniferous forest, Coastal prairie, Meadows and seeps, Valley and foothill grassland; mesic, sometimes granitic/annual herb/Apr–June(July)/16–1,390	Low potential to occur. The BSA supports marginally suitable habitat for this species. The CNDDB lists two modern occurrences of this species within wet meadows. One occurrence from 2017 approximately 1.5 miles east of the BSA and one occurrence from 2018 approximately 2.2 miles southwest of the BSA (CDFW 2021; No. 21 and 22).

Notes: BSA = Biological Study Area; CNDDB = California Natural Diversity Database.

Status Legend
Federal
FE: Federally listed as endangered
FT: Federally listed as threatened
FC: Federal candidate for listing as threatened or endangered
State
SE: State listed as endangered
ST: State listed as threatened
SR: State listed as rare
CRPR (California Rare Plant Rank)
CRPR 1A: Plants presumed extinct in California and either rare or extinct elsewhere
CRPR List 1B: Plants rare, threatened, or endangered in California and elsewhere
CRPR List 2A: Plants rare, threatened, or endangered in California but common elsewhere
CRPR List 2B: Plants rare, threatened, or endangered in California but more common elsewhere
Threat Rank
.1 Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 Fairly endangered in California (20% to 80% of occurrences threatened/moderate degree and immediacy of threat)
.3 Not very endangered in California (less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known).

References

CDFW (California Department of Fish and Wildlife). 2020. RareFind 5, Version 5.2.14. California Natural Diversity Database. Sacramento, California: CDFW, Biogeographic Data Branch. Accessed February 2020. https://map.dfg.ca.gov/rarefind/view/RareFind.aspx.

USDA (U.S. Department of Agriculture). 2020. Web Soil Survey: Santa Cruz County Area. USDA, Natural Resources Conservation Service, Web Soil Survey Staff. Accessed February 2020. http://websoilsurvey.nrcs.usda.gov/.

Appendix G

Special-Status Wildlife Species Potentially Occurring within the Biological Study Area

Scientific Name	Common Name	Status (Federal/State)	Primary Habitat Associations	Potential to Occur
Amphibians				
Ambystoma californiense	California tiger salamander	FT/ST, WL	Annual grassland, valley–foothill hardwood, and valley–foothill riparian habitats; vernal pools, other ephemeral pools, and (uncommonly) along stream courses and man-made pools if predatory fishes are absent	Not expected to occur. The BSA is outside the known distribution of this species.
Ambystoma macrodactylum croceum	Santa Cruz long-toed salamander	FE/FP, SE	Dense riparian vegetation, thick coastal scrub, and oak woodland	Not expected to occur. Although dense riparian vegetation and oak woodland is present, the BSA is located outside the known range of this species, which is restricted to southern Santa Cruz county (south of Aptos Creek) and northern Monterey county (CDFW 2021c). There are no CNDDB occurrences of this species within 5 miles of the BSA (CDFW 2021c).
Aneides flavipunctatus niger	Santa Cruz black salamander	None/SSC	Restricted to mesic forests in the fog belt of the outer Coast Range of San Mateo, Santa Cruz, and Santa Clara counties. Mixed deciduous and coniferous woodlands and coastal grasslands. Occurs in moist streamside microhabitats and is found under rocks, talus, and damp woody debris.	High potential to occur. The BSA supports suitable moist streamside habitats within deciduous and coniferous woodlands as required for this species. This species has historically been documented on numerous occasions near the BSA (CDFW 2021c).
Dicamptodon ensatus	California giant salamander	None/SSC	Known from wet coastal forests and chaparral near streams and seeps from Mendocino Co. south to Monterey Co. and east to Napa Co. Aquatic larvae found in cold, clear streams, occasionally in lakes and ponds. Adults known from wet forests under rocks and logs near streams and lakes.	High potential to occur. The BSA supports suitable wet coastal forest and chaparral habitat near cold streams as required for this species. This species has historically been documented on numerous occasions near the BSA (CDFW 2021c).

Scientific Name	Common Name	Status (Federal/State)	Primary Habitat Associations	Potential to Occur
Rana boylii	foothill yellow-legged frog	None/SSC, SE	Rocky streams and rivers with open banks in forest, chaparral, and woodland	Low potential to occur. The BSA supports some suitable rocky stream habitat within forests and woodlands, however the majority of the streamside banks are densely vegetated with little to no openings in the canopy for basking, and minimal pools for breeding. A sub-adult individual was observed in 2018 in a small seep area at the base of Newell Creek Dam, approximately 0.23 miles northwest of the Newell Creek Road segment by Dudek herpetologist C. Seltenrich (Occ. No. 2440, CDFW 2021c). However, this observation was assumed to be of an individual who had dispersed downstream from Newell Creek and was temporarily utilizing the seep as refugia habitat (Dudek 2018). All other occurrences in the BSA vicinity are from 1931 (CDFW 2021c).

Scientific Name	Common Name	Status (Federal/State)	Primary Habitat Associations	Potential to Occur
Rana draytonii	California red-legged frog	FT/SSC	Lowland streams, wetlands, riparian woodlands, livestock ponds; dense, shrubby or emergent vegetation associated with deep, still or slow-moving water; uses adjacent uplands	Low potential to occur. The BSA supports some suitable lowland streams and riparian woodlands with few areas containing still or slow-moving water suitable for breeding. Most aquatic features are narrow, steep, roadside drainages, ditches and tributaries that contain little to no ponding water or emergent vegetation. Some features, such as the northern reach of Newell Creek and the reach of Eagle Creek that crosses underneath Pipeline Trail, may provide foraging habitat, but are not expected to support breeding due to the presence of predatory fish and lack of calm, clear, pooled water. There are several CNDDB occurrences within 1 to 4 miles of the BSA (CDFW 2021c).
Reptiles				
Actinemys marmorata	western pond turtle	None/SSC	Slow-moving permanent or intermittent streams, ponds, small lakes, and reservoirs with emergent basking sites; adjacent uplands used for nesting and during winter.	Moderate potential to occur. Suitable perennial stream habitat is present within the BSA but the majority of the drainages are fairly incised with steep, narrow banks that limit accessibility to adjacent uplands. Larger streams within the BSA (such as San Lorenzo River and Zayante Creek), provide suitable foraging and basking habitat for this species, and western pond turtle has been documented historically within these areas (CDFW 2021c).

Scientific Name	Common Name	Status (Federal/State)	Primary Habitat Associations	Potential to Occur
Thamnophis sirtalis tetrataenia	San Francisco garter snake	FE/FP, SE	Wide range of habitats including grasslands or wetlands adjacent to ponds, marshes, and sloughs	Not expected to occur. The BSA supports marginal slow-moving aquatic habitat, however the majority of the aquatic features lack emergent vegetation for cover. Many of the drainages within the BSA are too steep and narrow to support this species, and the larger features likely support unsuitable stream velocities during high flows. Additionally, the BSA is located outside of the known range for this species, which is typically limited to wetland areas on the San Francisco Peninsula and coasts of Santa Cruz County (USFWS 2017). The closest CNDDB occurrences are in the Ano Nuevo or Franklin Point USGS quadrangles, more than 10 miles west of the BSA (CDFW 2021c).
Birds				
Agelaius tricolor (nesting colony)	tricolored blackbird	BCC/SSC, ST	Nests near freshwater, emergent wetland with cattails or tules, but also in Himalayan blackberry; forages in grasslands, woodland, and agriculture	Not expected to nest or forage. The BSA does not support freshwater, emergent wetland habitat as required for nesting for this species, and foraging habitat is marginal. The majority of the grassland areas are disturbed and adjacent to urban/residential development, limiting the likelihood that tricolored blackbird would use these areas for foraging. The nearest CNDDB occurrence is approximately 2.5 miles south of the BSA (CDFW 2021c).

Scientific Name	Common Name	Status (Federal/State)	Primary Habitat Associations	Potential to Occur
Aquila chrysaetos (nesting & wintering)	golden eagle	BCC/FP, WL	Nests and winters in hilly, open/semi-open areas, including shrublands, grasslands, pastures, riparian areas, mountainous canyon land, open desert rimrock terrain; nests in large trees and on cliffs in open areas and forages in open habitats	Not expected to nest or forage. The majority of the BSA consists of dense redwood and coniferous forest, with only small grassland openings that are highly disturbed and immediately adjacent to urban/residential development, limiting the likelihood that golden eagle would nest or forage within these areas. There are no CNDDB occurrences of this species within 5 miles of the BSA (CDFW 2021c).
Athene cunicularia (burrow sites & some wintering sites)	burrowing owl	BCC/SSC	Nests and forages in grassland, open scrub, and agriculture, particularly with ground squirrel burrows	Not expected to nest or forage. The BSA supports limited open grassland or agriculture habitat as required for this species. Existing grassland habitat within the BSA is heavily disturbed (i.e., previously used as Christmas tree farms or for horseback riding), and immediately surrounded by urban/residential development. The nearest CNDDB occurrence is 1.35 miles southwest of the BSA at U.C. Santa Cruz, where burrowing owls are known to winter (CDFW 2021c).

Scientific Name	Common Name	Status (Federal/State)	Primary Habitat Associations	Potential to Occur
Brachyramphus marmoratus (nesting)	marbled murrelet	FT/SE	Nests in old-growth coastal forests, forages in subtidal and pelagic habitats	Low potential to occur. The BSA is within the nesting range of this species in Santa Cruz County and supports coniferous forest; an individual was also detected flying overhead in 2018 by Dudek biologists at Newell Creek Dam, approximately 0.2 miles northwest of the Newell Creek Road segment (Dudek 2018). However, the known nesting areas for this species are located in the Pescadero Creek, Butano Creek, Little Butano Creek, Gazos Creek, Cascade Creek, Waddell Creek, and Scott Creek watersheds northwest of the BSA. The nearest CNDDB occurrence of this species is approximately 2 miles west of the BSA in the Fall Creek sub-watershed within Henry Cowell Redwoods State Park (CDFW 2021c); this area represents the only occupied murrelet habitat in the San Lorenzo River watershed (Halbert and Singer 2017). Critical habitat for this species overlaps with the southern extent of the BSA.
Charadrius alexandrinus nivosus (nesting)	western snowy plover	FT, BCC/SSC	On coasts nests on sandy marine and estuarine shores; in the interior nests on sandy, barren or sparsely vegetated flats near saline or alkaline lakes, reservoirs, and ponds	Not expected to occur. The BSA does not support suitable nesting or foraging habitat for this species, which is only known to nest along the immediate coast and on former salt ponds in South San Francisco Bay in this region* (CDFW 2021c).
Contopus cooperi (nesting)	olive-sided flycatcher	BCC/SSC	Nests in mixed-conifer, montane hardwood–conifer, Douglas-fir, redwood, red fir, and lodgepole pine habitats; usually close to water	High potential to nest and forage. The BSA supports suitable nesting and foraging habitat for this species. There are several eBird occurrences during the nesting season near the BSA (eBird 2021).

Scientific Name	Common Name	Status (Federal/State)	Primary Habitat Associations	Potential to Occur
Coturnicops noveboracensis	yellow rail	BCC/SSC	Nesting requires wet marsh/sedge meadows or coastal marshes with wet soil and shallow, standing water	Not expected to occur. The BSA does not support suitable nesting or foraging habitat for this species.
Cypseloides niger (nesting)	black swift	BCC/SSC	Nests in moist crevices, caves, and cliffs behind or adjacent to waterfalls in deep canyons; forages over a wide range of habitats	Not expected to nest, low potential to forage. Suitable cliff or deep canyon habitat for nesting is not present within the BSA, although this species might forage within and adjacent to the BSA from time to time. This species is known to nest along the coastal cliffs and caves of Santa Cruz, over 5 miles southeast of the BSA (CDFW 2021c).
Elanus leucurus (nesting)	white-tailed kite	None/FP	Nests in woodland, riparian, and individual trees near open lands; forages opportunistically in grassland, meadows, scrubs, agriculture, emergent wetland, savanna, and disturbed lands	High potential to nest and low potential to forage. The BSA supports suitable woodland and riparian habitat required for nesting for this species. However, open grassland and meadow habitats for foraging are sparse and generally surrounded by residential development. The nearest CNDDB occurrence is approximately 1.5 miles west of the BSA (CDFW 2021c).
Empidonax traillii extimus (nesting)	southwestern willow flycatcher	FE/SE	Nests in dense riparian habitats along streams, reservoirs, or wetlands; uses variety of riparian and shrubland habitats during migration	Not expected to nest or forage. Although dense riparian vegetation is present along some of the streams within the BSA, most streamside habitat consists of redwood or coniferous forest that is not used by this subspecies. Additionally, the BSA is outside the typical range of this species, and there are no CNDDB occurrences west of the Sierra Nevada Mountains, or north of the Santa Ynez River (CDFW 2021c).

Scientific Name	Common Name	Status (Federal/State)	Primary Habitat Associations	Potential to Occur
Falco peregrinus anatum (nesting)	American peregrine falcon	FDL, BCC/FP, SDL	Nests on cliffs, buildings, and bridges; forages in wetlands, riparian, meadows, croplands, especially where waterfowl are present	Not expected to nest or forage. The BSA does not support suitable cliff-nesting habitat for this species, which is only known to nest along the immediate coast within the region* (CDFW 2021c).
Geothlypis trichas sinuosa	saltmarsh common yellowthroat	BCC/SSC	Nests and forages in emergent wetlands including woody swamp, brackish marsh, and freshwater marsh	Not expected to nest or forage. The BSA does not support suitable nesting or foraging habitat for this species. There are no CNDDB occurrences within 5 miles of the BSA (CDFW 2021c).
Laterallus jamaicensis coturniculus	California black rail	BCC/FP, ST	Tidal marshes, shallow freshwater margins, wet meadows, and flooded grassy vegetation; suitable habitats are often supplied by canal leakage in Sierra Nevada foothill populations	Not expected to nest or forage. The BSA does not support suitable nesting or foraging habitat for this species.
Progne subis (nesting)	purple martin	None/SSC	Nests and forages in woodland habitats including riparian, coniferous, and valley foothill and montane woodlands; in the Sacramento region often nests in weep holes under elevated freeways	Low potential to nest and forage. Although the BSA provides suitable woodland and coniferous habitat for this species, few suitable tree cavities were observed during biological surveys, and this species is more typically associated with the Sacramento region. There are no CNDDB occurrences of this species within 5 miles of the BSA (CDFW 2021c).
Riparia riparia (nesting)	bank swallow	None/ST	Nests in riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with sandy soils; open country and water during migration	Not expected to nest or forage. The BSA does not support suitable nesting cliff habitat for this species, and open country and water habitat for foraging is limited. The nearest CNDDB occurrence is approximately 2 miles south of the BSA, however the occurrence is historic (1891-1954) and the exact location is unknown (CDFW 2021c).
Sternula antillarum browni (nesting colony)	California least tern	FE/FP, SE	Forages in shallow estuaries and lagoons; nests on sandy beaches or exposed tidal flats	Not expected to nest or forage. The BSA does not support suitable nesting or foraging habitat for this species.

Scientific Name	Common Name	Status (Federal/State)	Primary Habitat Associations	Potential to Occur
Vireo bellii pusillus (nesting)	least Bell's vireo	FE/SE	Nests and forages in low, dense riparian thickets along water or along dry parts of intermittent streams; forages in riparian and adjacent shrubland late in nesting season	Not expected to nest or forage. Although some areas of the BSA support marginal riparian habitat for this species, most streamside habitat consists of redwood or coniferous forest that is not used by this species. There are no CNDDB occurrences within 5 miles of the BSA (CDFW 2021c).
Fishes				
Eucyclogobius newberryi	tidewater goby	FE/None	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County, to the mouth of the Smith River	Not expected to occur. Suitable brackish water habitat for this species is absent from the BSA.
Oncorhynchus kisutch pop. 4	coho salmon - central California coast ESU	FE/SE	Streams and small freshwater tributaries during first half of life cycle and estuarine and marine waters of the Pacific Ocean during the second half of life cycle. Spawns in small streams with stable gravel substrates.	Low potential to occur. The BSA supports suitable habitat for this species in the San Lorenzo River and its tributaries (including Newell Creek) and a few individuals were observed in Bean Creek and Zayante Creek in 2005, but overall few coho have been observed in the watershed in recent years (City, in preparation). The upper reach of Newell Creek is considered inaccessible to coho due to a natural bedrock sheld approximately 0.7 mile downstream of Newell Creek Dam that acts as a movement barrier (HES 2017; City, in preparation).

Scientific Name	Common Name	Status (Federal/State)	Primary Habitat Associations	Potential to Occur
Oncorhynchus mykiss irideus pop. 8	steelhead - central California coast DPS	FT/None	Coastal basins from Redwood Creek south to the Gualala River, inclusive; does not include summer-run steelhead	Moderate potential to occur. This species has historically occurred within the San Lorenzo River and tributaries that overlap the BSA, and is known to occur in Newell Creek (CDFW 2021c). However, there are several barriers to passage from the lower San Lorenzo River to the segments that cross or overlap the BSA (e.g., bedrock shelf 0.7 mile downstream of Newell Creek Dam, shallow riffles in vicinity of Tait Diversion and Henry Cowell State Park, Felton Diversion Dam) (HES 2014; City, in prep.)and high flow events would be needed for this species to travel upstream.
Thaleichthys pacificus	eulachon	FT/None	Found in Klamath River, Mad River, and Redwood Creek and in small numbers in Smith River and Humboldt Bay tributaries	Not expected to occur. The BSA is outside the known distribution of this species.
Mammals				
Antrozous pallidus	pallid bat	None/SSC	Grasslands, shrublands, woodlands, forests; most common in open, dry habitats with rocky outcrops for roosting, but also roosts in man-made structures and trees	Moderate potential to roost and forage. The BSA contains suitable woodland and forest habitat with dense stands of trees for foraging and roosting, however rocky outcrops, the preferred roosting substrate for this species, are absent from the BSA. The nearest CNDDB occurrence is approximately 3 miles northwest of the BSA.

Scientific Name	Common Name	Status (Federal/State)	Primary Habitat Associations	Potential to Occur
Corynorhinus townsendii	Townsend's big-eared bat	None/SSC	Mesic habitats characterized by coniferous and deciduous forests and riparian habitat, but also xeric areas; roosts in limestone caves and lava tubes, man-made structures, and tunnels	Moderate potential to roost and forage. The BSA supports suitable coniferous forest and riparian habitat for this species, however preferred roosting substrate (limestone caves and lava tubes) are absent from the BSA. However, several buildings and bridges over stream crossings within the BSA may provide suitable roosting substrate for this species. The nearest CNDDB occurrence is approximately 3.5 miles southeast of the BSA (CDFW 2021c).
Lasiurus blossevillii	western red bat	None/SSC	Forest, woodland, riparian, and orchards, including fig, apricot, peach, pear, almond, walnut, and orange; roosts in tree canopy	Moderate potential to roost and forage. The study area supports suitable forest and woodland habitat for this species. There are no CNDDB occurrences in the vicinity but bats are poorly represented in the CNDDB.
Dipodomys venustus venustus	Santa Cruz kangaroo rat	None/Special Animals	Shrub communities on sandy soils in the Santa Cruz Mountains, including silverleaf manzanita chaparral.	High potential to occur. The Graham Hill Road North alignment bisects one of the two CNDDB occurrences atop Mount Hermon. Suitable silverleaf manzanita chaparral habitat is also present adjacent to the Newell Creek Road and Glen Arbor Road Proposed Project alignments.
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	None/SSC	Forest habitats with a moderate canopy and moderate to dense understory	High potential to occur. Numerous woodrat middens were observed within the BSA during biological surveys, and suitable forest habitat for this species occurs throughout the BSA. However, it is not possible to discern N. fuscipes and N. fuscipes annectens species phenotypically, although the BSA does fall within the historic range of N. fuscipes annectens. The nearest CNDDB occurrence is approximately 4.75 miles southwest of the BSA (CDFW 2021c).

Scientific Name	Common Name	Status (Federal/State)	Primary Habitat Associations	Potential to Occur
Taxidea taxus	American badger	None/SSC	Dry, open, treeless areas; grasslands, coastal scrub, agriculture, and pastures, especially with friable soils	Not expected to occur. The BSA supports limited open grassland or agriculture habitat as required for this species. Existing grassland habitat within the BSA is heavily disturbed (i.e., previously used as Christmas tree farms or for horseback riding), and immediately surrounded by urban/residential development. The nearest CNDDB occurrence is approximately 1.3 miles southwest of the BSA (CDFW 2021c).
Invertebrates				
Bombus crotchii	Crotch bumble bee	None/PSE	Open grassland and scrub communities supporting suitable floral resources.	Low potential to occur. The BSA supports limited open grassland with suitable floral resources; potentially suitable scrub communities are prevalent, however. There are no documented CNDDB occurrences of this species within 5 miles of the BSA (CDFW 2021c).
Bombus occidentalis	western bumble bee	None/PSE	Once common and widespread, species has declined precipitously from central California to southern British Columbia, perhaps from disease	Low potential to occur. The BSA supports limited open grassland with suitable floral resources; potentially suitable scrub communities are prevalent, however. The nearest CNDDB occurrence is a 1998 specimen collection approximately 0.65 mile southwest of the Pipeline Road section (CDFW 2021c; No. 309).
Cicindela ohlone	Ohlone tiger beetle	FE/None	Remnant native grasslands with California oatgrass (Danthonia californica) and purple needlegrass (Stipa pulchra) in Santa Cruz County	Not expected to occur. The BSA does not support suitable native grassland habitat. The nearest CNDDB occurrence is approximately 0.6 miles southwest of the Graham Hill Road section, where adults were observed from 2000 to 2004 (CDFW 2021c; No. 1).

Scientific Name	Common Name	Status (Federal/State)	Primary Habitat Associations	Potential to Occur
Danaus plexippus	monarch butterfly	FC/None	Wind-protected tree groves with nectar sources and nearby water sources	Low potential to occur. The BSA occurs along existing road alignments that support limited areas of suitable wind-protected groves. The nearest CNDDB occurrences are from 1984 and 1998 approximately 1.4 miles south and 1.6 miles northeast of the BSA, respectively (CDFW 2021c; No. 101 and 102).
Polyphylla barbata	Mount Hermon (=barbate) June beetle	FE/None	Known only from sand hills in vicinity of Mount Hermon, Santa Cruz County	High potential to occur. Known to occur in BSA along Graham Hill Road section (CDFW 2021c). This species is likely to occur in portions of the BSA with Zayante sand soil (including transition soils) as well as adjacent sandy loam soils, including developed and paved areas.
Euphilotes enoptes smithi	Smith's blue butterfly	FE/None	Sand dunes, scrub, chaparral, grassland, and their ecotones	Not expected to occur. The BSA does not support suitable habitat for this species.
Trimerotropis infantilis	Zayante band-winged grasshopper	FE/None	Isolated sandstone deposits in the Santa Cruz Mountains (the Zayante Sand Hills ecosystem)	Moderate potential to occur. Open areas of silverleaf manzanita chaparral within the Newell Creek Road and Graham Hill Road North sections of the BSA are moderately suitable. Within the Project area at these locations, there is limited habitat in road turnouts on Zayante soils adjacent to suitable habitat; these areas feature loose sand soil and open canopies as well as sparse herbaceous vegetation suitable for the species. Remaining sections of the BSA provide low-quality habitat or are unsuitable (i.e., Glen Arbor Road section).

Notes: BSA = Biological Study Area; CNDDB = California Natural Diversity Database; USGS = U.S. Geological Survey; ESU = Evolutionarily Significant Unit, DPS = Distinct Population Segment.
Status Legend
Federal
BCC: Bird of Conservation Concern
FC: Candidate for federal listing as threatened or endangered

FDL: Federally delisted; monitored for 5 years
FE: Federally listed endangered
FT: Federally listed as threatened
State
PSE: Proposed state listing as endangered
SDL: State delisted
SSC: Species of Special Concern
FP: California Department of Fish and Wildlife Protected and Fully Protected Species
SE: State listed as endangered
ST: State listed as threatened

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Appendix C

Cultural Resources Reports

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Appendix C-1

Archaeological Resources Inventory and Evaluation Report

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ARCHAEOLOGICAL RESOURCES INVENTORY AND EVALUATION REPORT FOR THE NEWELL CREEK PIPELINE IMPROVEMENT PROJECT

Prepared for:

CITY OF SANTA CRUZ
Water Department
212 Locust Street Suite D
Santa Cruz, California 95060
Doug Valby, PE, City of Santa Cruz Water Department

Prepared by:

John P. Schlagheck, MA, RPA; and Sarah Brewer, BA
DUDEK
725 Front Street, Suite 400
Santa Cruz, California 95060

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
ACHP	Advisory Council on Historic Preservation
APE	area of potential effect
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
CRHR	California Register of Historical Resources
FBPS	Felton Booster Pump Station
GHWTP	Graham Hill Water Treatment Plant
NCP	Newell Creek Pipeline
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
PRC	Public Resources Code
SCWD	Santa Cruz Water Department
SLF	Sacred Lands File
USACE	U.S. Army Corps of Engineers

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Executive Summary

The City of Santa Cruz retained Dudek to complete a cultural resources inventory and evaluation report for a project to replace 8.75 miles of the existing Newell Creek Pipeline (NCP) Improvement Project with a new 24–inch pipeline (Proposed Project) in Santa Cruz, California. To implement the proposed action, permitting through federal agencies, potentially including, but not limited to the U.S. Army Corps of Engineers (USACE) and Federal Emergency Management Agency (FEMA), may be necessary. Federal agencies are required to comply with Section 106 of the National Historic Preservation Act (NHPA). In accordance with the NHPA's implementing regulations, 36 CFR 800.4, the federal agencies require an inventory of cultural resources within the Proposed Project's area of potential effect (APE) in order to determine the presence or absence of historic properties and potential effects upon those properties.

This report addresses archaeological resources and includes the following components: (1) a California Historical Resources Information System (CHRIS) records search conducted by the Northwest Information Center (NWIC); (2) a Sacred Lands File (SLF) search by the Native American Heritage Commission (NAHC); (3) outreach to locally affiliated Native American tribes; (4) pedestrian survey of the Proposed Project site for evidence of archaeological resources; (5) a determination regarding whether or not there are historic properties or historical resources within the Proposed Project APE that might be affected by the Proposed Project under Section 106 of the NHPA and the California Environmental Quality Act (CEQA).

This report is intended to assist the lead agencies with their requirements the requirements of Section 106 of the National Historic Preservation Act of 1966, as amended (2004) (NHPA; 36 CFR 800, as amended 2004), and California Environmental Quality Act (CEQA), both of which require lead agencies to determine whether a discretionary project may have a significant impact on historic properties (NHPA) or historical resources (CEQA). The City of Santa Cruz is the CEQA lead agency for the Proposed Project. The purpose of this report is to identify all cultural resources within the Proposed Project's Area of Potential Effect (APE) and to determine whether the Proposed Project/undertaking would result in a significant impact to a historical resource under CEQA or an adverse effect to an historic property under Section 106 of the NHPA. This report does not address built environment resources within the Proposed Project APE. Built Environmental cultural resources within the Proposed Project APE are addressed in the separate *Historical Resources Inventory And Evaluation Report For The Newell Creek Pipeline Improvement Project* (Dudek 2021).

No archaeological resources were identified within the APE during the CHRIS records search, Native American coordination, or archaeological survey. There is potential for previously unknown, subsurface archaeological deposits and human remains to be uncovered during earth disturbing activities. Therefore, Dudek recommends the implementation of the City's Standard Construction Practice 17 regarding inadvertent discovery of archaeological deposits and Standard Construction Practice 18 regarding inadvertent discovery of human remains to reduce potential impacts to any unanticipated archaeological resources and human remains identified during construction, both of which are part of the Proposed Project.

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1 Project Location and Description and Area of Potential Effects (APE)

1.1 Project Location and Description

The Proposed Project is in Santa Cruz County California beginning approximately three miles north of Monterey Bay and trending north/south to a point approximately ten miles north of Monterey Bay (Figures 1 and 2). The existing Newell Creek Pipeline (NCP) consists of two primary segments (Northern and Southern) with a total length of approximately 8.75 miles. The Northern Segment connects Newell Creek Dam and Felton Booster Pump Station (Figure 3), and the Southern Segment connects Felton Booster Pump Station (FBPS) and Graham Hill Water Treatment Plant (GHWTP) (Figure 4). The existing pipeline ranges in size from 18 to 27 inches in diameter, with the majority at 20 or 22 inches in diameter.

The Proposed Project consists of replacement of approximately 8.75 miles of the existing NCP with a new 24-inch polyvinylchloride (PVC), ductile iron, or high-density polyethylene (HDPE) pipeline, except for one pipe section that will be a 30-inch high-density polyethylene (HDPE) pipe. The purpose of the Proposed Project is to address the identified deficiencies in existing pipeline conditions and provide improved access for maintenance and repair. The pipeline generally would be installed within existing road pavement, road rights-of-way, and/or existing or new Santa Cruz Water Department (SCWD) easements. The proposed NCP Northern Segment would generally follow the existing NCP alignment, with a few minor variations to avoid crossing private property. The Southern Segment of the proposed NCP from the FBPS to the GHWTP would generally consist of a new pipeline constructed within the Graham Hill Road ROW that would avoid/replace the existing NCP through Henry Cowell Redwoods State Park. Once the new pipeline is installed and the interconnections are made, the existing NCP would be abandoned in place and injected with grout.

1.2 Project Area of Potential Effect (APE)

The proposed Area of Potential Effects (APE) for archaeological resources (Figures 5A and 5B) includes those areas where project ground-disturbing activities would occur, including construction staging areas. The width of the ground disturbance along the construction route varies between 10 to 120 feet. The vertical APE for the Proposed Project is generally between 5 and 15 feet below ground surface and is variable based on the diameter of the pipe installed and ground conditions, except that the Brackney North section may be deeper at up to 50 feet below ground surface.

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2 Regulatory Context

2.1 Federal

The NHPA established the NRHP and the President's Advisory Council on Historic Preservation (ACHP) and provides that states may establish State Historic Preservation Officers to carry out some of the functions of the NHPA. Most significantly, for federal agencies responsible for managing cultural resources, Section 106 of the NHPA directs that

> [t]he head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP.

Section 106 also affords the ACHP a reasonable opportunity to comment on the undertaking (16 U.S.C. 470f).

Title 36 of the Code of Federal Regulations, Part 800 (36 CFR 800) implements Section 106 of the NHPA. It defines the steps necessary to identify historic properties (those cultural resources listed in or eligible for listing in the NRHP), including consultation with federally recognized Native American tribes to identify resources with important cultural values; to determine whether or not they may be adversely affected by a proposed undertaking; and the process for eliminating, reducing, or mitigating the adverse effects.

The content of 36 CFR 60.4 defines criteria for determining eligibility for listing in the NRHP. The significance of cultural resources identified during an inventory must be formally evaluated for historic significance in consultation with the ACHP and the California State Historic Preservation Officer to determine if the resources are eligible for inclusion in the NRHP. Cultural resources may be considered eligible for listing if meet one of the four significance criteria and they possess integrity of location, design, setting, materials, workmanship, feeling, and association.

Regarding criteria A through D of Section 106, the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, cultural resources, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that (36 CFR 60.4):

A. Are associated with events that have made a significant contribution to the broad patterns of our history; or
B. Are associated with the lives of persons significant in our past; or
C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. have yielded or may be likely to yield, information important in prehistory or history.

The 1992 amendments to the NHPA enhance the recognition of tribal governments' roles in the national historic preservation program, including adding a member of a Native American tribe or Native Hawaiian organization to the ACHP.

The NHPA amendments:

- Clarify that properties of traditional religious and cultural importance to a Native American tribe or Native Hawaiian organization may be determined eligible for inclusion in the National Register
- Reinforce the provisions of the Council's regulations that require the federal agency to consult on properties of religious and cultural importance.

The 1992 amendments also specify that the ACHP can enter into agreement with tribes that permit undertakings on tribal land and that are reviewed under tribal regulations governing Section 106. Regulations implementing the NHPA state that a federal agency must consult with any Native American tribe that attaches religious and cultural significance to historic properties that may be affected by an undertaking.

2.2 State of California

2.2.1 The California Register of Historical Resources

In California, the term "historical resource" includes "any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California" (Public Resources Code (PRC) Section 5020.1(j)). In 1992, the California legislature established the California Register of Historical Resources (CRHR) "to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1(a)). The criteria for listing resources on the CRHR, enumerated in the following text, were developed to be in accordance with previously established criteria developed for listing in the NRHP. According to PRC Section 5024.1(c)(1–4), a resource is considered historically significant if it (i) retains "substantial integrity," and (ii) meets at least one of the following criteria:

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

To understand the historic importance of a resource, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource less than 50 years old may be considered for listing in the CRHR, as well as for federal listing, if it can be demonstrated that sufficient time has passed to understand its historical importance (see 14 CCR 4852(d)(2)).

The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP, and properties listed or formally designated as eligible for listing in the NRHP are automatically listed in the CRHR, as are state landmarks and points of interest. The CRHR also includes properties designated under local ordinances or identified through local historical resource surveys.

2.2.2 California Environmental Quality Act

As described further in the following text, the following CEQA statutes and CEQA Guidelines are of relevance to the analysis of archaeological, historic, and tribal cultural resources:

> PRC Section 21083.2(g) defines "unique archaeological resource."
>
> PRC Section 21084.1 and CEQA Guidelines Section 15064.5(a) define "historical resources." In addition, CEQA Guidelines Section 15064.5(b) defines the phrase "substantial adverse change in the significance of an historical resource." It also defines the circumstances when a project would materially impair the significance of a historical resource.
>
> PRC Section 21074(a) defines "tribal cultural resources."
>
> PRC Section 5097.98 and CEQA Guidelines Section 15064.5(e) set forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony.
>
> PRC Sections 21083.2(b)–(c) and CEQA Guidelines Section 15126.4 provide information regarding the mitigation framework for archaeological and historic resources, including examples of preservation-in-place mitigation measures; preservation-in-place is the preferred manner of mitigating impacts to significant archaeological sites because it maintains the relationship between artifacts and the archaeological context, and may also help avoid conflict with religious or cultural values of groups associated with the archaeological site(s).

Under CEQA, a project may have a significant effect on the environment if it may cause "a substantial adverse change in the significance of an historical resource" (PRC Section 21084.1; CEQA Guidelines Section 15064.5(b)). If a site is either listed or eligible for listing in the CRHR, or if it is included in a local register of historic resources, or identified as significant in a historical resources survey (meeting the requirements of PRC Section 5024.1(q)), it is a "historical resource" and is presumed to be historically or culturally significant for purposes of CEQA (PRC Section 21084.1; CEQA Guidelines Section 15064.5(a)). The lead agency is not precluded from determining that a resource is a historical resource, even if it does not fall within this presumption (PRC Section 21084.1; CEQA Guidelines Section 15064.5(a)).

A "substantial adverse change in the significance of an historical resource" reflecting a significant effect under CEQA means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (CEQA Guidelines Section 15064.5(b)(1); PRC Section 5020.1(q)). In turn, the significance of a historical resource is materially impaired when a project does any of the following:

1. Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register; or
2. Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to Section 5020.1(k) of the PRC or its identification in an historical resources survey meeting the requirements of Section 5024.1(g) of the PRC, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or

3. Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register as determined by a lead agency for purposes of CEQA [CEQA Guidelines Section 15064.5(b)(2)].

Pursuant to these sections, the CEQA inquiry begins with evaluating whether a project site contains any "historical resources," then evaluates whether that project will cause a substantial adverse change in the significance of a historical resource such that the resource's historical significance is materially impaired.

If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that they cannot be left undisturbed, mitigation measures are required (Section 21083.2(a), (b), and (c)).

Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

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

Impacts to non-unique archaeological resources are generally not considered a significant environmental impact ((PRC Section 21083.2(a); CEQA Guidelines Section 15064.5(c)(4)). However, if a non-unique archaeological resource qualifies as tribal cultural resource (PRC 21074(c); 21083.2(h)), further consideration of significant impacts is required.

CEQA Guidelines Section 15064.5 assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. As described in the following text, these procedures are detailed in PRC Section 5097.98.

2.2.3 Native American Historic Cultural Sites

State law (PRC Section 5097 et seq.) addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, or inadvertent destruction; establishes procedures to be implemented if Native American skeletal remains are discovered during construction of a project; and established the Native American Heritage Commission (NAHC) to resolve disputes regarding the disposition of such remains. In addition, the Native American Historic Resource Protection Act makes it a misdemeanor punishable by up to 1 year in jail to deface or destroy a Native American historic or cultural site that is listed or may be eligible for listing in the CRHR.

2.2.4 California Health and Safety Code section 7050.5

In the event that Native American human remains or related cultural material are encountered, Section 15064.5(e) of the CEQA Guidelines (as incorporated from PRC Section 5097.98) and California Health and Safety Code Section 7050.5 define the subsequent protocol. If human remains are encountered, excavation or other disturbances shall

be suspended of the site or any nearby area reasonably suspected to overlie adjacent human remains or related material. Protocol requires that a county-approved coroner be contacted in order to determine if the remains are of Native American origin. Should the coroner determine the remains to be Native American, the coroner must contact the NAHC within 24 hours. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98 (14 CCR 15064.5(e)).

2.2.5 Local

This inventory report also serves to comply with local cultural and paleontological resource protection regulations. The SCWD is not subject to the Santa Cruz County General Plan but is subject to the Local Coastal Program (SCCGP-LCP 1994), although the APE is not located in the coastal zone. Nevertheless, the investigation is consistent with the County's General Plan, Objective 5.19, which outlines steps to protect and preserve archaeological resources within the County. This report complies with Policy 5.19.2, site surveys, which requires archaeological surveys in areas determined to have very high potential for cultural resources; the potential is determined by the inventory of nearby archaeological sites, or if the project location is within an area mapped as archaeologically sensitive.

Chapters 16.40 (Native American Cultural Sites) and 16.44 (Paleontological Resource Protection) of the Santa Cruz County Code also outline methods and regulations for the identification and treatment of cultural and paleontological resources within the County.

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3 Environmental Setting

The Proposed Project's northern extent is located within the Newell Creek Watershed in the Santa Cruz mountains approximately 1.2 miles upstream from the confluence with the San Lorenzo River. The APE trends south east of the San Lorenzo River to just east of Zayante Creek and then follows Graham Hill Road to the GHWTP at its southern terminus. The climate is characterized as Mediterranean, with warm dry summers and cool wet winters. The average rainfall is 49 inches, generally with no snow. The APE drops from an elevation of 400 feet above mean sea level in the north to about 200 feet in the south. Adjacent land uses are a mixture rural and suburban, with recreational areas and private residences near the APE. The natural vegetation in the Proposed Project vicinity is dominated by redwood forest regime (Küchler 1977), but includes a California annual grassland, coyote brush scrub, mixed chaparral, and Douglas fir forest and other forest types, which include Douglas fir (*Pseudotsuga menziesii*), redwood (*Sequoia sempervirens*), bigleaf maple (*Acer macrophyllum*), and coast live oak (*Quercus agrifolia*), among other species. The understory is composed of coyote brush (*Baccharis pilularis*), French broom (*Genista monspessulana*) ferns, poison oak (*Toxicodendron diversilobum*), blackberry (Rubus ursinus) and seasonal grasses. The Natural Resources Conservation Service (NRCS) maps numerous soil types within the 9.25-mile APE (USDA 2021).

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4 Cultural Setting

4.1 Prehistory

The APE lies within the territory that was occupied by the Costanoan or Ohlone people prior to European contact. Costanoan refers to eight separate Penutian-stock language groups situated roughly from modern-day Richmond in the north to Big Sur in the south. The Awaswas tribelet occupied the Santa Cruz Mountains and the San Lorenzo River Valley at the time of European contact (Levy 1978).

Glimpses into the ways of life for prehistoric Californians continue to be pieced together through studies of ethnography and archaeology. Early European explorers from the 16th and 18th centuries provided the first written descriptions about the native Californians they encountered, although details are sparse. Attempts at systematic ethnographies did not occur until the early 20th century, generations after the effects of missionization and integration had altered Costanoan/Ohlone lifestyles drastically. Much of these studies focused on recording Native languages before they fell into disuse. Information from the archaeological record continues to fill in the gaps of prehistoric lifeways. Archaeologists extrapolate trends in tool use, trade, diet, and migration from studies on archaeological sites. Costanoan/Ohlone descendants are often invited to participate in decisions about their ancestral sites as well as educate others about their traditional lifeways.

New archaeological finds continue to fill in the gaps of our understanding of prehistoric lifeways. Jones et al. (2007) present a synthetic overview of prehistoric adaptive change in the Central Coast. This temporal framework for the prehistoric era of greater Central California coast, spans a period of approximately 10,000–12,000 years, and divides into six different periods. Researchers distinguish these periods by perceived changes in prehistoric settlement patterns, subsistence practices, and technological advances. These adaptive shifts identify differences in temporally discrete artifact assemblages, site locations, and site types. Table 1 summarizes the cultural chronology presented by Jones et al. (2007).

Table 1. California Central Coast Chronology

Temporal Period	Date Range*
Paleo-Indian	pre-8000 cal BC
Millingstone (or Early Archaic)	8000 to 3500 cal BC
Early	3500 to 600 cal BC
Middle	600 cal BC to cal AD 1000
Middle-Late Transition	cal AD 1000-1250
Late	cal AD to 1250-1769

Source: Jones et al. (2007).

4.1.1 Paleo-Indian Period

The Paleo-Indian era represents people's initial occupation of the region and is quite sparse across the Monterey Bay region. Evidence of this era is generally expressed through isolated artifacts or sparse lithic scatters (Bertrando 2004). Farther south, in the San Luis Obispo area, fluted points characterizing this era are documented near the town of Nipomo (Mills et al. 2005) and Santa Margarita (Gibson 1996). No points of this type have been found yet in the Monterey Bay region. Possible occupation dating to the Paleo-Indian period is reported at CA-SCR-38/123,

at Wilder Ranch (Bryne 2002), and in CA-SCR-177 in Scotts Valley (Cartier 1993). The traditional interpretation is that people living during this time were highly mobile hunters who focused subsistence efforts on large mammals. In contrast, Erlandson et al. (2007) propose a "kelp highway" hypothesis for the peopling of the Americas. Proponents of this model argue that the earliest inhabitants of the region migrated by sea and focused their economic pursuits on coastal resources. Paleo-Indian sites in the Santa Barbara Channel Islands support this hypothesis, but there is little evidence within the greater Bay Area. Some scholars hypothesize that Paleo-Indian sites in the Bay Area may exist but are inundated due to rising ocean levels throughout the Holocene (Jones and Jones 1992).

4.1.2 Millingstone Period

Settlement in the Central Coast appears with more frequency in the Millingstone Period. Sites of this era have been discovered in Big Sur (Jones 1993; Fitzgerald and Jones 1999) and Moss Landing (Jones and Jones 1992; Milliken et al. 1999). Assemblages are characterized by abundant millingstones and handstones, core and core-cobble tools, thick rectangular (L-series) Olivella beads, and a low incidence of projectile points, generally lanceolate or large side-notched varieties (Jones et al. 2007). Eccentric crescents are also found in Millingstone components. Sites are often associated with shellfish remains and small mammal bone, which suggest a collecting-focused economy. Newsome et al. (2004) report that stable isotope studies on human bone, from a Millingstone component, indicate a diet composed of 70%–84% marine resources. Contrary to these findings, deer remains are abundant at some Millingstone sites (cf. Jones et al. 2008), which suggests a flexible subsistence focus. People living during the Millingstone era are thought to have been highly mobile.

4.1.3 Early Period

The Early Period corresponds with the earliest instance of the "Hunting Culture" which continues through to the Middle-Late Transition (Rogers 1929). This period is marked by a greater emphasis on formalized flaked stone tools, such as projectile points and bifaces, and the initial use of mortar and pestle technology. Early Period sites are located in more varied environmental contexts than Millingstone sites, suggesting more intensive use of the landscape than previous eras (Jones and Waugh 1997). Early Period artifact assemblages are characterized by large side-notched points, Rossi Square-stemmed points, Spire-lopped (A), End-ground (B2b and B2c), Cap (B4), and Rectangular (L-series) Olivella beads. Other artifacts found during this period are less temporally diagnostic, such as the Contracting-stemmed points, Año Nuevo long-stemmed points, and bone gorges. Early Period sites are common and often found in estuary settings along the coast or along river terraces inland and are present in both Monterey and Santa Cruz Counties. Coastal sites dating to this period include CA-MNT-108 (Breschini and Haversat 1992a), CA-SCR-7 (Jones and Hildebrandt 1990), and components of CA-SCR-38/123 (Jones and Hildebrandt 1994).

Archaeologists have long debated whether the shift in site locations and artifact assemblages during this time represent either population intrusion as a result of mid-Holocene warming trends, or an in-situ adaptive shift (cf. Mikkelsen et al. 2000). The initial use of mortars and pestles during this time appears to reflect a more labor-intensive economy associated with the adoption of acorn processing (cf. Basgall 1987).

4.1.4 Middle Period

The trend toward greater labor investment is apparent in the Middle Period. During this time, there is increased use of plant resources, more long-term occupation at habitation sites, and a greater variety of smaller "use-specific" localities. Artifacts common to this era include Contracting-stemmed projectile points, a greater variety of Olivella shell beads and Haliotis ornaments that include discs and rings (Jones 2003). Bone tools and ornaments are also

common, especially in the richer coastal contexts (Jones and Ferneau 2002a; Jones and Waugh 1995), and circular shell fishhooks are present for the first time. Grooved stone net sinkers are also found in coastal sites. Mortars and pestles become more common than millingstones and handstones at some sites (Jones et al. 2007). Important Middle Period sites include CA-MNT-282 at Willow Creek (Jones 2003; Pohorecky 1976), components of CA-MNT-229 at Elkhorn Slough (Dietz et al. 1988), CA-SCR-9 and CA-SMA 218 at Año Nuevo (Hylkema 1991).

The Middle Period continues the pattern of the "Hunting Culture" that began in the Early Period (Jones et al. 2007; Rogers 1929). The pattern reflects a greater emphasis on labor-intensive technologies that include projectile and plant processing. Additionally, faunal evidence highlights a shift toward prey species that are more labor intensive to capture, either by search and processing time or through technological needs. These labor-intensive species include small schooling fishes, sea otters, rabbits, and plants such as acorn. Early and Middle Period sites are difficult to distinguish without shell beads due to the similarity of artifact assemblages (Jones and Haney 2005).

4.1.5 Middle-Late Transition Period

The Middle-Late Transition marks the end of the "Hunting Culture." Artifacts associated with the Middle-Late Transition include contracting-stemmed, double side-notched, and small leaf-shaped projectile points. The latter are thought to represent the introduction of bow and arrow technology to the region. A variety of Olivella shell bead types are found in these deposits and include B2, B3, G1, G2, G6, and K1 varieties (Jones 1995). Notched line sinkers, hopper mortars, and circular shell fishhooks are also present (Jones et al. 2007). Sites that correspond with this time are CA-MNT-1233 and CA-MNT-281 at Willow Creek (Pohorecky 1976), CA-MNT-1754, and CA-MNT-745 in Priest Valley (Hildebrandt 2006).

The Middle-Late Transition is a time that appears to correspond with social reorganization across the region. This era is also a period of rapid climatic change known as the Medieval Climatic Anomaly (cf. Stine 1994). The Medieval Climatic Anomaly is proposed as an impetus for the cultural change that was a response to fluctuations between cool-wet and warm-dry conditions that characterize the event (Jones et al. 1999). Archaeological sites are rarer during this period, which may reflect a decline in regional population (Jones and Ferneau 2002b).

4.1.6 Late Period

Late Period sites are found in a variety of environmental conditions and include newly occupied task sites and encampments, as well as previously occupied localities. Artifacts associated with this era include Cottonwood and Desert Side-notched arrow points, flaked stone drills, steatite and clamshell disc beads, Haliotis disc beads, Olivella bead types E1 and E2, and earlier used B2, B3, G1, G6, and K1 types. Millingstones, handstones, mortars, pestles, and circular shell fishhooks also continue to be used (Jones et al. 2007). Sites dating to this era are found in coastal and interior contexts. Late Period sites include CA-MNT-143 at Asilomar State Beach (Brady et al. 2009), CA-MNT-1765 at Moro Cojo Slough (Fitzgerald et al. 1995), CA-MNT-1485/H and CA-MNT-1486/H at Rancho San Carlos (Breschini and Haversat 1992b), and CA-SCR-117 at Davenport Landing (Fitzgerald and Ruby 1997).

Coastal sites dating to the Late Period tend to be more resource acquisition or processing sites, while residential occupation is more common inland (Jones et al. 2007).

4.2 History

4.2.1 Spanish Period (1542–1822)

The earliest known European visitor to the Monterey Peninsula was Juan Rodríquez Cabrillo, a Portuguese explorer who was sent by the Viceroy of New Spain in 1542 to explore the Pacific coast north of Mexico. In 1602, Sebastián Vizcaíno led a Spanish envoy mission to survey the California coastline to locate feasible ports for shipping. Finding the bay to be commodious, fertile, and extremely favorable for anchorage, Vizcaíno named the Bay "Monterey" after the Conde de Monterey, the Spanish Viceroy of New Spain (Chapman 1920).

Despite being mapped as an advantageous berth for Spanish shipping efforts, the epicenter of Spanish settlement in Alta California, the Spanish colonial state that included all of the modern U.S. states of California, Nevada, and Utah, and parts of Arizona, Wyoming, Colorado, and New Mexico, did not make its way to the Monterey Bay until the second half of the eighteenth century. In an effort to prevent the establishment of English and Russian colonies in northern Alta California, Don Gaspar de Portolá, the Governor of Baja, embarked on a voyage in 1769 to establish military and religious control over the area. This overland expedition by Portolá marks the beginning of California's Historic period, occurring just after King Carlos III of Spain installed the Franciscan Order to direct religious colonization in assigned territories of the Americas (Kyle 2002; Koch 1973).

On their quest to locate the Monterey Bay from the 160-year-old accounts of Sebastián Vizcaíno, the Portolá expedition first reached the present-day Live Oak area on October 17, 1769, encountering the three creeks that empty to the bay forming deep gulches that lead back to the mountains. The expedition continued on, reaching the region of Santa Cruz a week later. After mistakenly circumventing the Monterey Bay and reaching the San Francisco Bay, the expedition backtracked to San Diego. The following year on May 31, 1770, a second expedition was organized by Portolá resulting in a successful location of the Monterey Bay. However, it would be an additional 21 years before the Franciscan order would establish Mission Santa Cruz (Koch 1973).

Father Fermín Lasuén, Corporal Luis Peralta, and five soldiers established Mission Santa Cruz on August 28, 1791, as the twelfth mission in the California Mission system. The Spanish missions drastically altered the lifeways of the Native Americans. Spanish missionaries conscripted members of local Native American communities to move to the Mission, where they were indoctrinated as Catholic neophytes. Villa Branciforte was also established at that time on the eastern part of Santa Cruz as one of three Spanish civil settlements in California. The land taken by the Spanish was eventually repatriated to the Native tribes, but the massive decline in the population as a result of disease and cultural disintegration meant that by the time the land was repatriated , few eligible recipients remained alive and in the area (Koch 1973).

4.2.2 Mexican Period (1822–1848)

After more than a decade of intermittent rebellion and warfare, New Spain (Mexico and the California territory) won independence from Spain in 1821. In 1822, the Mexican legislative body in California ended isolationist policies designed to protect the Spanish monopoly on trade, and decreed California ports open to foreign merchants. In 1834, the Mexican government secularized the mission lands releasing the Native Americans from control of the mission-system (Cleland 2005; Dallas 1955). Extensive land grants were established in the interior during the Mexican Period, in part to increase the population inland from the more settled coastal areas where the Spanish had first concentrated its colonization efforts. Land grants to citizens covered over 150,000 acres of present-day Santa Cruz County.

Jose Antonio Rodriguez served in the military in several locations in Alta California prior to his retirement at Villa Branciforte in 1798, along with his wife and nine children. His children went on to become the recipients of several land grants in present-day Santa Cruz County, including the 1,473-acre Arroyo del Rodeo land grand of 1834 in which the APE is located (Koch 1973; Robinson 2012).

4.2.3 American Period (1848–Present)

The Mexican–American War ended with the Treaty of Guadalupe Hidalgo in 1848, ushering California into its American Period. Santa Cruz was designated as one of the 27 original counties of California on February 18, 1850, shortly before California officially became a state with the Compromise of 1850 that also designated Utah and New Mexico (with present-day Arizona) as U.S. territories. The new state of California recognized the ownership of lands in the state distributed under the Mexican Land Grants of the previous several decades (Waugh 2003; Koch 1973).

As the Gold Rush was picking up steam in 1849, a massive influx of people seeking gold steadily flooded the rural counties of California. Insightful entrepreneurs in Santa Cruz also saw the arrival of opportunity-seeking laborers to harvest the abundant natural resources found throughout the area. The lumber, fishing, lime, cement, and leisure industries formed the economic foundation of the County of Santa Cruz, while in the fertile acreage of central and south Santa Cruz County, agriculture took hold as the leading economic venture (Koch 1973).

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5 Records Search Results

To identify cultural resources potentially affected by the Proposed Project, the City defined a records search study area that includes the APE, all alternative alignments, and a 0.25-mile buffer from the APE and alternative alignments for previously recorded resources and technical reports. The City obtained the CHRIS records search results from NWIC on April 3, 2020, (NWIC File No. 19-1522). The Records Search request reviewed:

- Archaeological and non-archaeological resource records and reports on file at NWIC
- Built Environment Resources Directory (BERD)
- OHP Archaeological Determinations of Eligibility
- California Inventory of Historical Resources (1976)
- Historical Maps
- Local Inventories

The records search revealed no previously recorded archaeological resources within the APE and 36 recorded resources within the study area buffer. Of the 36 known resources three are close enough to the APE to be reviewed in detail (CA-SCR-78, CA-SCR-112/H, and CA-SCR-162). These three resources are described in Section 5.1. There have been 168 previous archaeological studies conducted within in the greater study area. Of those 168 reports, 22 have project areas that intersect the APE, and thus relate directly to the Proposed Project. The 22 reports are discussed in Section 5.2. Collectively, the 22 reports demonstrate that approximately 65 percent of the APE has been previously surveyed and that some segments have been surveyed multiple times. Importantly, the previously surveyed area includes all the APE south of the FBPS where new pipeline trenching is proposed for the relocation of the NCP. Results of the records search are presented in Appendix A of this report.

5.1 Proximate Archaeological Resources

CA-SCR-78 (P-44-000083)

This resource is a bedrock mortar (BRM) milling station recorded by Lönnberg in 1972. There are nine mortar cups of various depth and diameters within two masses of indurated sandstone material covering an area of about 75 square feet (15 X 5 feet). Lönnberg noted scattered clam shells near the BRMs but attributed the debris to modern deposition.

The site record is not clear regarding the location of the resource from the APE, which at this location is the Graham Hill road right-of-way. The location is estimated to be approximately 250 feet east of the APE.

CA-SCR-112/H (P-27-000116)

This resource first recorded by Jean and Don Stafford in 1975 as a light scatter of chert lithic debris. Given the site location on a gentle slope above a small unnamed stream the recorders speculated that the location may have been an indigenous hunting station. Constituents noted from the site include a medial fragment of a Monterey chert biface tool, a few lithic debitage fragments and sparse marine shell. Historical debris including ceramic was also noted. A site record update (Cabrillo College ATP 2002) noted only two Monterey chert flakes and sparse historical debris including ceramic and window glass.

The site record is not clear regarding the location of the resource from the APE, which at this location is the Graham Hill road right-of-way directly across Graham Hill Road from CA-SCR-78. The location of CA-SCR-112/H is estimated to be approximately 100 feet west of the APE.

CA-SCR-162 (P-27-000165)

Morris (1977a) recorded this site as a midden deposit with flake stone tools, cores, debitage and fire affected rock. Morris interpreted the materials as a temporary indigenous campsite for short-term or seasonal use. The location is ambiguous relative to the APE, which is the Graham Hill Road right-of-way. The location is estimated to be approximately 300 feet west of Graham Hill Road and 1,000 feet south of the Graham Hill Road intersection at Sims Road.

5.2 Reports Associated with the APE

S-3917; Preliminary Archaeological Reconnaissance of Proposed Christian Life Center, Santa Cruz County, California

S-3917 reports the discovery of one prehistoric resource (CA-SCR-162) from a reconnaissance of 7.5 acres of land proposed for development west of Graham Hill Road approximately 1,600 feet south of the Sims Road intersection at Graham Hill Road (Morris 1977b). The report describes CA-SCR-162 north of the study's 7.5-acre project area and within the route of the planned access road to the proposed project. The associated map in the report indicates the site is located approximately 1,000 feet south of Sims Road and 300 feet west of Graham Hill Road. Morris recommended redesign of the planned access road to avoid impacts to the site.

S-4005; Cultural Resources Assessment of the Pasatiempo/Rollingwoods Wastewater Project Locations, Santa Cruz County, California

Chavez (1979) conducted a cultural resources assessment for a wastewater project that included survey of approximately 2.1 miles of Graham Hill Road right of way for a pipeline. Chavez noted the existence of CA-SCR-162 and estimated the distance of CA-SCR-162 from Graham Hill Road at 0.2 miles (1,050 feet) and recommended monitoring of construction on Graham Hill Road in the vicinity of the site. As calculated in this report, the distance of CA-SCR-162 from the APE is approximately 300 feet.

S-4074; Preliminary Archaeological Reconnaissance of the Bridal Path Estates Subdivision, Santa Cruz County, California

In 1980, Whitlow and Breschini conducted a phase one archaeological investigation for a 155-acre subdivision proposal located on the west side of Graham Hill Road at the intersection of Graham Hill Road and Sims Road. This investigation included survey of approximately 0.45 miles of the west side of the Graham Hill Road right-of-way. This segment of Graham Hill Road was also included in the survey reported in S-4005 (Chavez 1979) above. No cultural resources were reported near Graham Hill Road.

Other areas surveyed during their investigation were immediately adjacent to CA-SCR-162, the prehistoric site recorded by Morris in 1977. Whitlow and Breschini reported that they had access to the recorded location of CA-SCR-162 and that they tried to find the site in the field. They reported "An examination of the area described as CA-SCR-162 did not reveal any materials modified by human activities" and further, "Morris…reported Monterey banded chert flake tools, but none of this material was located during our survey" (Whitlow and Breschini:4).

S-4101; Environmental Assessment, City of Santa Cruz, Newell Creek Tract, Santa Cruz Co., California

This is a report for a 2,870-acre timber harvest plan for land surrounding the Loch Lomond Reservoir (Greig 1979). The northern 0.4 miles of the APE was included in the survey conducted by the author. No new cultural resources were found.

S-4125; Cultural Resources Evaluation for the Pasatiempo Pines Wastewater Facilities Project, Scotts Valley, Santa Cruz County, California

This report summarizes an approximately 400-acre survey for a wastewater facilities project (Chavez 1981). While this report study area does include approximately 1,500 feet of the east side of Graham Hill Road at the intersection of Graham Hill Road and Lockwood Lane, it is unclear what portions of the study area were intensively surveyed for cultural resources. In any case, no cultural resources were reported or discussed along Graham Hill Road.

S-6365; An Archaeological Reconnaissance of the Approximately 160 Acre Cowell Foundation Site, Southeast of the Town of Felton in Santa Cruz County, California

In 1984, Dietz conducted a phase one archaeological investigation for 160-acre Cowell Foundation property located on the west side of Graham Hill Road, north of the intersection of Graham Hill Road and Sims Road. This investigation included survey of approximately 0.85 miles of the west side of the Graham Hill Road right-of-way. This segment of Graham Hill Road is north of the area reported in S-4005 (Chavez 1979) above. No cultural resources were reported near Graham Hill Road.

S-14437; Preliminary Cultural Resources Reconnaissance of a Portion of the Graham Hill Subdivision, Santa Cruz County, California

In 1992, Runnings and Breschini conducted a phase one archaeological investigation for 20-acre portion of the Graham Hill Subdivision property located on the west side of Graham Hill Road, south of the intersection of Graham Hill Road and Sims Road. This investigation included survey of approximately 0.3 miles of the west side of the Graham Hill Road right-of-way. This segment of Graham Hill Road is south of the area reported in S-4074 (Whitlow and Breschini 1980) above. No cultural resources were reported near Graham Hill Road.

S-16692; Cultural Resource Evaluation of Redtree Properties, APN 71-201-43 and APN 71-331-05, -06, in the City of Felton, Santa Cruz County

Cartier (1994) surveyed 130 acres of land for two housing projects in the area east of the San Lorenzo River and north of Graham Hill Road in Felton (S-16692). The larger 115-acre western section of the survey area included the FBPS and approximately 0.4 miles of the APE. Cartier reported finding prehistoric items including a Monterey banded chert flake and a possible mano near a spring, and historical period remains including a picket fence with square nails in the northwest portion of the property, ceramics, a logging road, and evidence of logging activities. All the found resources were located east of the APE. The smaller 15-acre eastern section does not intersect the APE.

S-16692a; Historic Research and Archaeological Testing Program Evaluation for the Redtree Properties, APN 71-201-43 and APN 71-331-05, -06, in the City of Felton, Santa Cruz County

Cartier retuned to the property in 1995 and conducted subsurface testing where evidence of resources had been found (S-16692a). Additional historical research on the ownership history of the property was also presented at that time (S-16692a Appendix I). Two test units were excavated in the 115-acre parcel approximately 600 feet east of the APE. Both test units were uniformly negative for cultural resources (Cartier et al. 1995).

S-22415; Preliminary Archaeological Reconnaissance of the Mount Hermon Christian Conference Center, Mount Hermon, Santa Cruz County, California

Archaeological Consulting conducted a phase I cultural resources investigation (Doane and Haversat 1999) for a proposal to construct improvement to the Mount Hermon Christian Conference Center east of the Felton (S-22415). The extreme western portion of the investigation study area included approximately 0.17 miles of the APE and a staging area along the east site of Graham Hill road between East Zayante Road to Roaring Camp Road. No resources were reported near the APE.

S-22415a; Archaeological Assessment of the Sawmill Area and Southern Pacific Railroad Depot at Redwood Camp, Mount Hermon, California

A phase II historical report (S-22415a) that came out of the phase I investigation was focused on the historic site of the Redwood Camp Sawmill and the extant Felton Depot located approximately 0.4 miles northeast of the APE (Wills and Rushing 2002). The phase II work found minimal evidence for potentially significant archaeological resources. The report included a site record for the Southern Pacific Zayante Railroad Depot.

S-26659; Preliminary Archaeological Reconnaissance of the City of Santa Cruz Water Department Felton Booster Pump Station, Felton, Santa Cruz County, California

This report is from a survey of the FBPS property at 6000 East Zayante Road (Doane and Haversat 2003) located on the west bank of Zayante Creek and on the north side of Graham Hill Road. The survey included approximately 0.02 miles of the APE. The results of the survey were negative.

S-28321; Archaeological and Historical Resources Survey and Impact Assessment a Supplemental Report for a Timber Harvesting Plan, Dunworth THP, THP #1-94-566

This is a survey report for a timber harvest plan in the upper Newell Creek watershed (Paul 1994). The northwest corner of the timber harvest plan study area overlaps approximately 0.15 miles of the APE along Newell Creek Road just south of the northern terminus of the APE. No cultural resources were reported.

S-28447; Historic Property Survey Report, Graham Hill Road Improvements Project Near Felton, Santa Cruz County, California

S-28447a; Negative Archaeological Survey Report, Graham Hill Road Improvements Project Near Felton, Santa Cruz County, California

S-28447 is a Historic Properties Survey Report for a 0.64-mile segment of Graham Hill Road (Kelley 2004a) for a roadway safety improvement project. All of study area is within the APE and includes the right-of-way of Graham Hill Road from just west of Roaring Camp Road to a point on Graham Hill Road approximately 3,700 feet east Roaring Camp Road. The report included a phase I archaeological investigation (S-28447a) that was negative for archaeological resources (Kelley 2004b).

S-28447b; Historical Resources Evaluation Report, Graham Hill Road Improvements Project Near Felton, Santa Cruz County, California

S-28447c; California State Office of Historic Preservation Letter to Caltrans dated April 5, 2004

A second technical report (S-28447b) is a historical resource evaluation of built environment resources (Marvin 2004). The report presents a historical context, description of five resources, and a formal evaluation of five resources potentially impacted by the project with DPR 523 Series Forms for each resource. All five buildings were found to be not eligible for the National Register and for the purposes of CEQA. The project concurrence letter from SHPO (S-28447c) is dated April 5, 2004.

S-28809; An Archaeological Reconnaissance of the Proposed San Lorenzo Valley Trail Alignment Alternatives, Boulder Creek-Santa Cruz, Santa Cruz County, California

Clark (2004) conducted extensive surveys for the San Lorenzo Valley Train alignments. The coverage presented in the report includes the 4 miles of the APE along Graham Hill Road from Felton to the Graham Hill Water Treatment Plant. Clark noted the resources near the APE described in Section 5.1 of this report but did not report any found resources.

S-32657; Confidential Archaeological Addendum for Timber Operations on Non-Federal Lands in California, Graham Hill Showgrounds THP, THP#1-98-347 SCR

This report is an archaeological survey (McGuire 1998) for a timber harvest plan for 170 acres on the west side of Graham Hill Road near the intersection of Graham Hill Road and Sims Road. The study's project area only intersects the APE at Graham Hill Road fractionally (0.05 miles). No new resources were reported from the survey.

S-36272; Historic Properties Survey Report Cultural Resources Evaluation for the Proposed Incidental Take at the Graham Hill Water Treatment Plant, City of Santa Cruz, California

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

S-40205; Preliminary Archaeological Assessment for the Rolling Woods and Graham Hill/Woods Cove Sewer Annexation Project in Santa Cruz, Santa Cruz County, California

This report is from a records search and survey related to a sewer annexation project (Doane and Breschini 2013). The project area at that time included approximately 1.5 miles of the APE along Graham Hill Road from just north of Sims Road to the GHWTP. The report was negative for evidence of new archaeological resources.

S-50967; Archaeological Records Search and Site Reconnaissance, Ben Lomond Transfer Station Pond Drainage Repair, Assessor's Parcel 076-245-01, Santa Cruz County, California

Schlagheck (2017) conducted a records research and a field survey for a repair project related to storm runoff from the Ben Lomond Transfer Station property. The study's project area for the repairs was about 1,000 square feet adjacent to Newell Creek Road and includes a fractional portion (20 feet) of the APE on both sides of Newell Creek Road just south of the vehicular entrance to the Transfer Station on the west side of Newell Creek Road. No new resources were discovered.

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6 Native American Outreach

On January 19, 2021, Dudek sent a request to the Native American Heritage Commission (NAHC) for a search of the SLF, a list of properties important to local Native American tribes, for the Proposed Project vicinity. On January 27, 2021, Dudek received a letter from the NAHC with *negative* findings from the SLF search. NAHC also provided a list of Native American contacts that might have local knowledge of archaeological or tribal cultural resources near the Proposed Project.

To access additional information from local tribes, Dudek sent letters to the Native American contacts provided by the NAHC on February 3, 2021. On February 3, 2021, Valentine Lopez, Chairman of the Amah Mutsun Tribal Band, sent an email to Dudek indicating that he had no comment on the Proposed Project, but would like to request a Native American monitor from his tribe if cultural resources are encountered. On February 10, 2021, Mike Grone, Director of Archaeological Resource Management for Amah Mutsun Land Trust, requested an introduction to the Proposed Project and information on additional resources in the APE. Dudek provided the requested information, and Mr. Grone sent a second correspondence on February 15, 2021 indicating that Amah Mutsun Land Trust had no comments.

On March 3, 2021, the lead author called Ann Marie Sayers, Chairperson, Indian Canyon Mutsun Band of Costanoan,to inform her of an email failure of Dudek's email to her regarding the Proposed Project. Dudek sent a second email with a new email address to Ann Marie Sayers with the original Project letter on March 3, 2021.

No additional Native American contacts have responded to the outreach letters as of March 9, 2021. A complete record of the NAHC SLF search and Native American outreach effort is included in this report in Appendix B.

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7 Field Survey

Dudek conducted an intensive pedestrian reconnaissance survey for archaeological resources on all accessible land within the APE on December 2, 9, and 16, 2020. During each of these surveys, two Dudek archaeologists surveyed using 15- to 20-meter-spaced transects, with one person walking along either side of the existing or proposed pipeline alignment. The archaeologists inspected the ground for indications of prehistoric or historic archaeological sites and used the Esri Collector application on iPads to follow the Proposed Project alignment and to record the locations of any resources. Surface visibility for all three surveys was adequate for the purposes of the survey, however, paved surfaces and areas of thick vegetation limited visual access to the ground in some locations.

Dudek archaeologists, John Schlagheck, MA, and Sarah Brewer, BA, conducted the first of three pedestrian surveys of the APE on December 2, 2020. The survey was conducted with an escort from the SCWD, Doug Valby, and followed the San Lorenzo Way Section, the Brackney South Section, the Brackney North Section, and also the portion of the Newell Creek Road Section behind a locked gate that is owned by the SCWD (Figure 3). All of these portions represent parts of the existing pipeline alignment slated to be replaced in their current location.

The only cultural resource encountered during the December 2 survey was a portion of the former South Pacific Coast Railroad, of which Brackney was a stop. This railroad alignment is within in the Brackney North, Brackney South and San Lorenzo Way Sections and has already been impacted/re-purposed by the original NCP installation. This resource will be addressed in the built environment report for the Proposed Project.

On December 9, 2020, Dudek archaeologist, Sarah Brewer, BA, and Dudek architectural historian, Fallin Steffen, MA, conducted a pedestrian survey with SCWD escort, Doug Valby, along the Pipeline Road Section within Henry Cowell Park. This section contains an existing alignment of the pipeline which is proposed to be re-routed along Graham Hill Road. If this abandonment occurs, the only ground-disturbance along this alignment would be the removal of the existing apertures such as the vents and wharf valves, and filling of those holes with grout or cement. The existing pipeline will be addressed in the built environment report for the Proposed Project.

On December 16, 2020, Sarah Brewer, BA, and Julie Royer, MA, conducted a survey focused on the public portion of the Newell Creek Road Section, the Glen Arbor Road Section, the Felton Booster Section, and the Graham Hill Road Section. These sections represent existing alignments to be replaced, existing alignments to be abandoned and proposed re-alignments (Figures 3 and 4). Existing alignments to be replaced include the Newell Creek Road Section, approximately 75% of the Glen Arbor Road Section, approximately 50% of the Felton Booster Section, and approximately 25% of the Graham Hill Road Section. Existing alignments to be abandoned and/or realigned include a small portion at the northern and southern extents of the Glen Arbor Road Section, approximately 50% of the Felton Booster Section and approximately 75% of the Graham Hill Road Sections. Dudek archaeologists did not encounter any archaeological resources during this portion of the survey.

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8 Summary and Recommendations

8.1 Summary of Findings

The CHRIS records search, Native American coordination, and field survey did not identify any archaeological resources within the APE or any specific cultural resource sensitivity concerns. The three known resources (CA-SCR-78, CA-SCR-112/H, and CA-SCR-162) previously recorded relatively close to the APE have been reviewed in detail (Section 5.1). Due to the location and characteristics of these resources, they are not likely to be impacted by the Proposed Project. However, it is always possible that intact archaeological deposits are present in subsurface contexts. Given this potential, Dudek provides recommendations for addressing unanticipated discoveries in Section 8.2.

The findings of this study are that the Proposed Project will have no significant impact on potentially significant historical resources under CEQA. Furthermore, the Proposed Project will have **No Adverse Effect** on Historic Properties of an archaeological nature under Section 106 of the NHPA.

8.2 Management Recommendations

No further effort regarding the discovery of archaeological resources within the APE is warranted. However, the Proposed Project should proceed under a plan that accounts for the inadvertent discovery of archaeological resources during construction consistent with NHPA Section 106 regulations, CEQA, and applicable local regulations.

Unanticipated Discovery of Archaeological Resources and Human Remains

The City has adopted standard construction practices that would be implemented by the City or its contractors during construction activities associated with the Proposed Project, Standard Construction Practice 24 regarding inadvertent discovery of archaeological deposits and Standard Construction Practice 25 regarding inadvertent discovery of human remains to reduce potential impacts to any unanticipated archaeological resources and human remains identified during construction.

24. Any unrecorded archaeological resources (sites, features, and/or artifacts) exposed during construction are subject to protection and consideration under CEQA and the California Public Resources Code (PRC) as well as Section 106 of the National Historic Preservation Act (NHPA) as detailed in the Code of Federal Regulations (CFR). The CEQA Guidelines Section 15064.5(f) specifically addresses provisions the City of Santa Cruz will make regarding accidental discovery of historical or unique archaeological resources during construction. The responsibilities of the lead federal agency to avoid, minimize or mitigate adverse effects to a "historic property" (36 CFR Section 800.16) are detailed in 36 CFR Section 800.13[b] and would be applicable for a project with federal involvement by way of funding, permitting, approval authority, or other means.

    In general, the implementation procedures under CEQA and the NHPA in the case of an inadvertent archaeological discovery during construction are similar and are as follows:

    - If archaeological resources are exposed immediately stop any construction work occurring within 100 feet which may further disturb the find. NOTE – This is a general guideline for the initial

response, the exclusion zone may be contracted or expanded depending on the nature of discovery and type of construction activity proposed in the vicinity of the find. The duration of the exclusion zone will be determined by the City and the federal lead agency and is contingent on the approved course of action in response to the discovery.

- Immediately notify the City Project Manager who shall immediately notify the Water Department Deputy Director/Engineering Manager
- A qualified archaeologist meeting the Secretary of the Interior's Professional Qualification Standards will evaluate the state and federal significance of the find for eligibility to the California Register of Historical Resources (CRHR) and the National Register of Historic Places (NRHP) in coordination with City staff.
- The City will notify the lead federal agency within 24 hours of discovery. The notification shall describe the assessment of the NRHP eligibility of the resource, specify the NRHP criteria used to evaluate the property's eligibility, and propose actions to resolve any adverse effects.
- The federal lead agency will contact the State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP), and any interested locally affiliated Native American tribes. The SHPO, ACHP, and Native American tribes will respond within 48 hours of the notification. The federal lead agency shall consider any recommendations regarding National Register eligibility and proposed actions and notify the City of the appropriate actions. The federal lead agency official shall provide the SHPO and the ACHP a report of the actions when they are completed.
- Avoidance and/or minimization of impacts/effects is the preferred course of actions under both state and federal guidelines. If preservation in place is not feasible, additional study will likely be required. In coordination with the lead federal agency, the City will prepare a data recovery/treatment plan for retrieving important archaeological data relevant to the site's significance. The data recovery/treatment plan will be submitted to participating tribes and agencies for review and comment prior to implementation.
- If the inadvertent discovery location cannot be avoided, and continuing work would have an adverse effect on the site, the federal agency, in coordination with the City, SHPO, and Native American tribes as appropriate, will need to draft and finalize a Memorandum of Agreement for the treatment of the historic property before work can proceed.
- Implementation of the data recovery/treatment plan may include archaeological excavations, technical and laboratory analysis, and further consultation and coordination with Native American tribal representatives.
- A full written report will be prepared to include the results of all technical analyses and special studies and will be provided to participating tribes and agencies for review and comment. The report will be filed with the Northwest Information Center and will also provide for the permanent curation of recovered materials.

25. In California, the illegal possession of human remains is a felony, punishable by imprisonment (California Penal Code Section 1170[h]; Public Resources Code 5097.99[a] and [b]). Inadvertent discoveries of human remains exposed during construction on non-federal lands are subject to protection under CEQA and the NHPA. In accordance with Section 7050.5 of the California Health and Safety Code and the NHPA, if potential human remains are found, immediately notify the City, the lead federal agency, and the Santa Cruz County Coroner of the discovery. The Santa Cruz County Coroner will provide a determination within

48 hours of notification. No further excavation or disturbance of the identified material, or any area reasonably suspected to overlie additional remains, can occur until a determination has been made.

- If human remains are exposed immediately stop any construction work occurring within 100 feet which may further disturb the find. NOTE – This is a general guideline for the initial response, the exclusion zone may be contracted or expanded depending on the nature of discovery and type of construction activity proposed in the vicinity of the find. The duration of the exclusion zone is contingent on the course of action mandated by the City and lead federal agency.
- If the Santa Cruz County Coroner determines that the remains are, or are believed to be, Native American, the coroner will notify the Native American Heritage Commission (NAHC) within 24 hours and all the actions described in these Standard Construction Practices regarding Inadvertent Archaeological Discoveries shall be followed.
- In accordance with California Public Resources Code, Section 5097.98 and Section 106 of the NHPA, the NAHC must immediately notify those persons it believes to be the Most Likely Descendant (MLD) from the deceased Native American.
- Within 48 hours of this notification, the MLD will recommend to the City and lead federal agency her/his preferred treatment of the remains and associated grave goods.
- The ultimate disposition of the remains will be coordinated between the City, the federal agency, the MLD, the landowner, and the NAHC (if necessary).
- The lead federal agency will have additional government-to-government consultation requirements per the requirements of Section 106 [36 CFR § 800.2(c)(2)(ii)] which cannot be delegated to non-federal entities.

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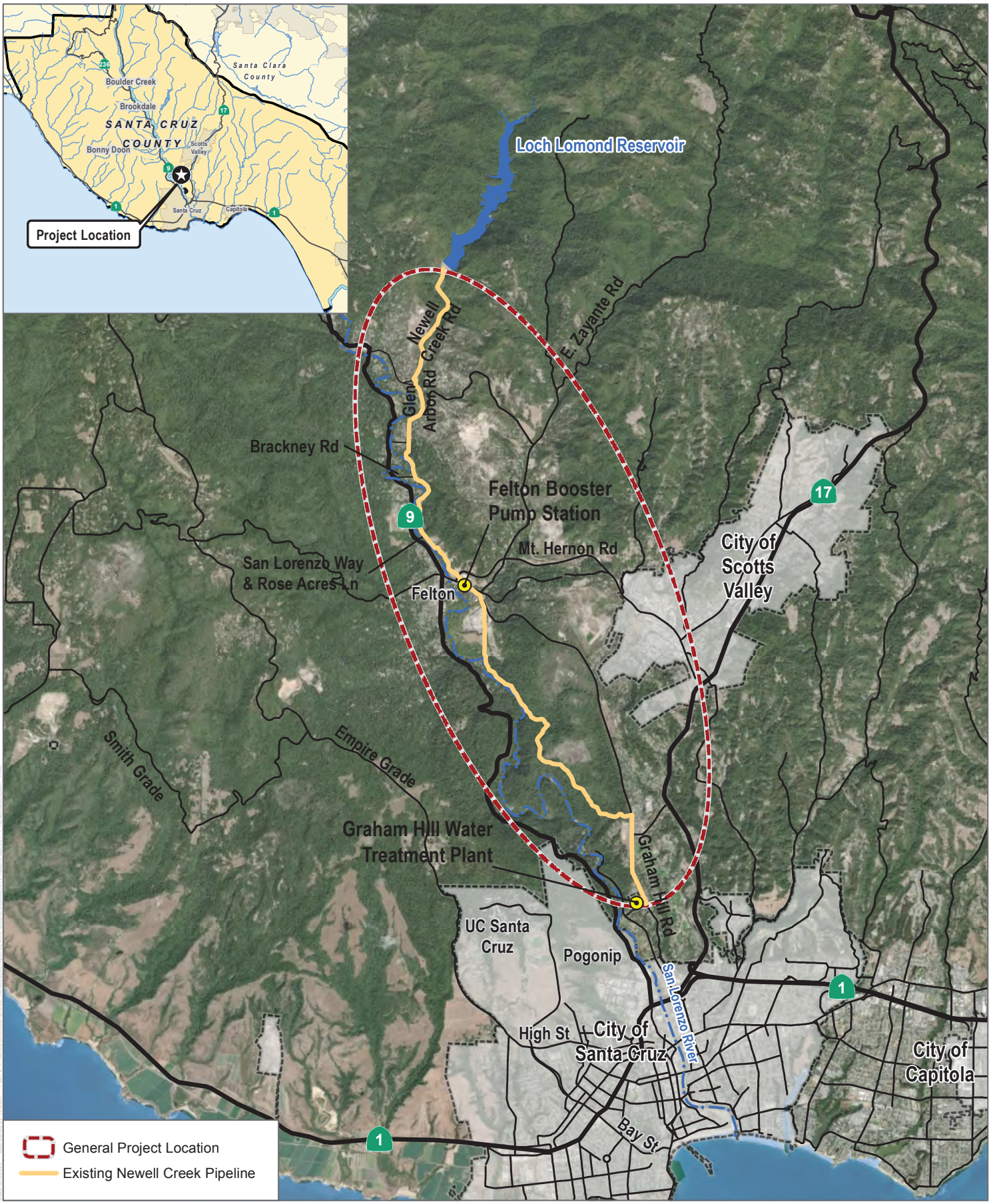
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SOURCE: ESRI 2020, City of Santa Cruz 2020

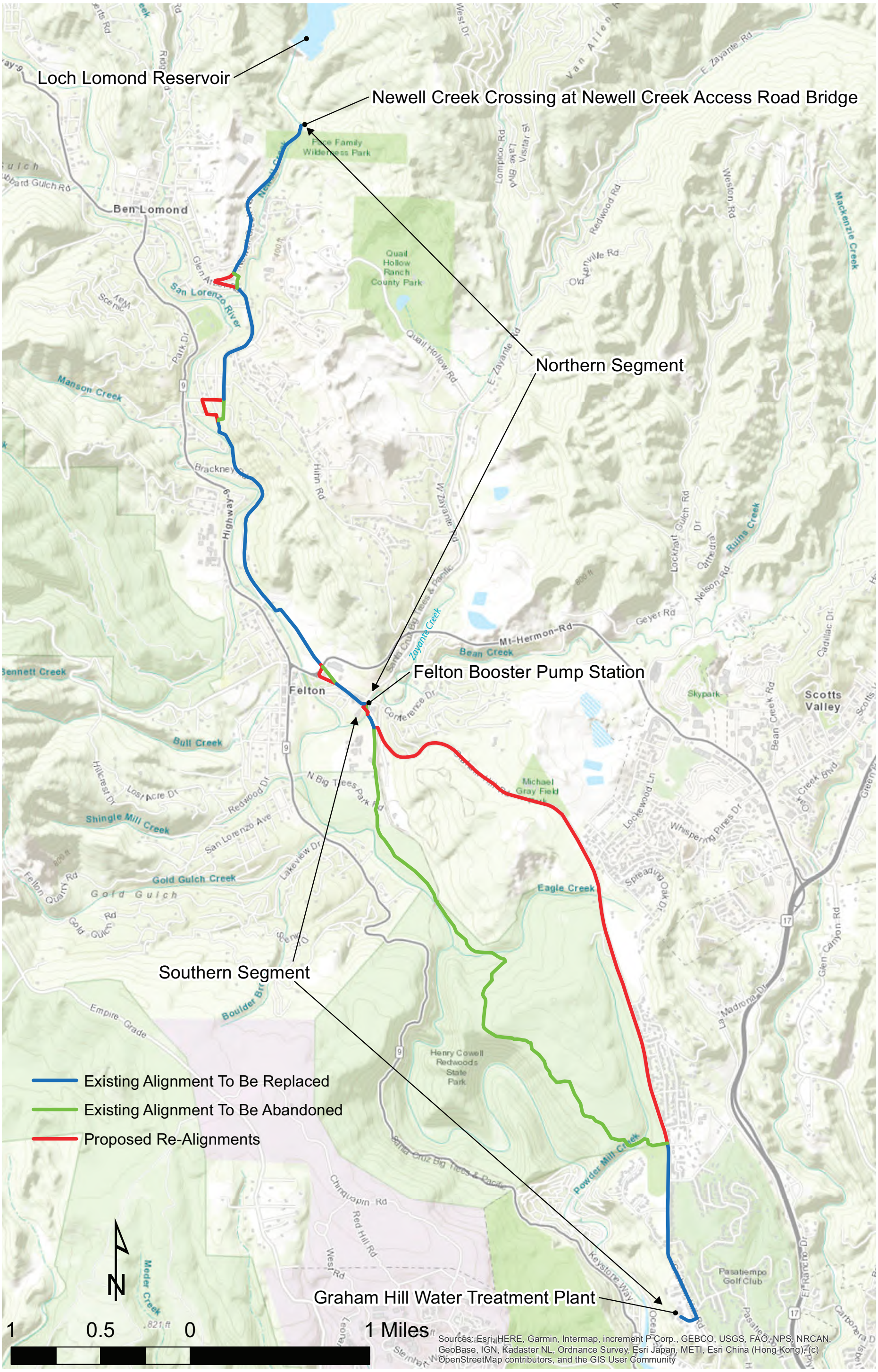
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0 3,750 7,500 Feet

FIGURE 1

Project Location

Newell Creek Pipeline Improvement Project

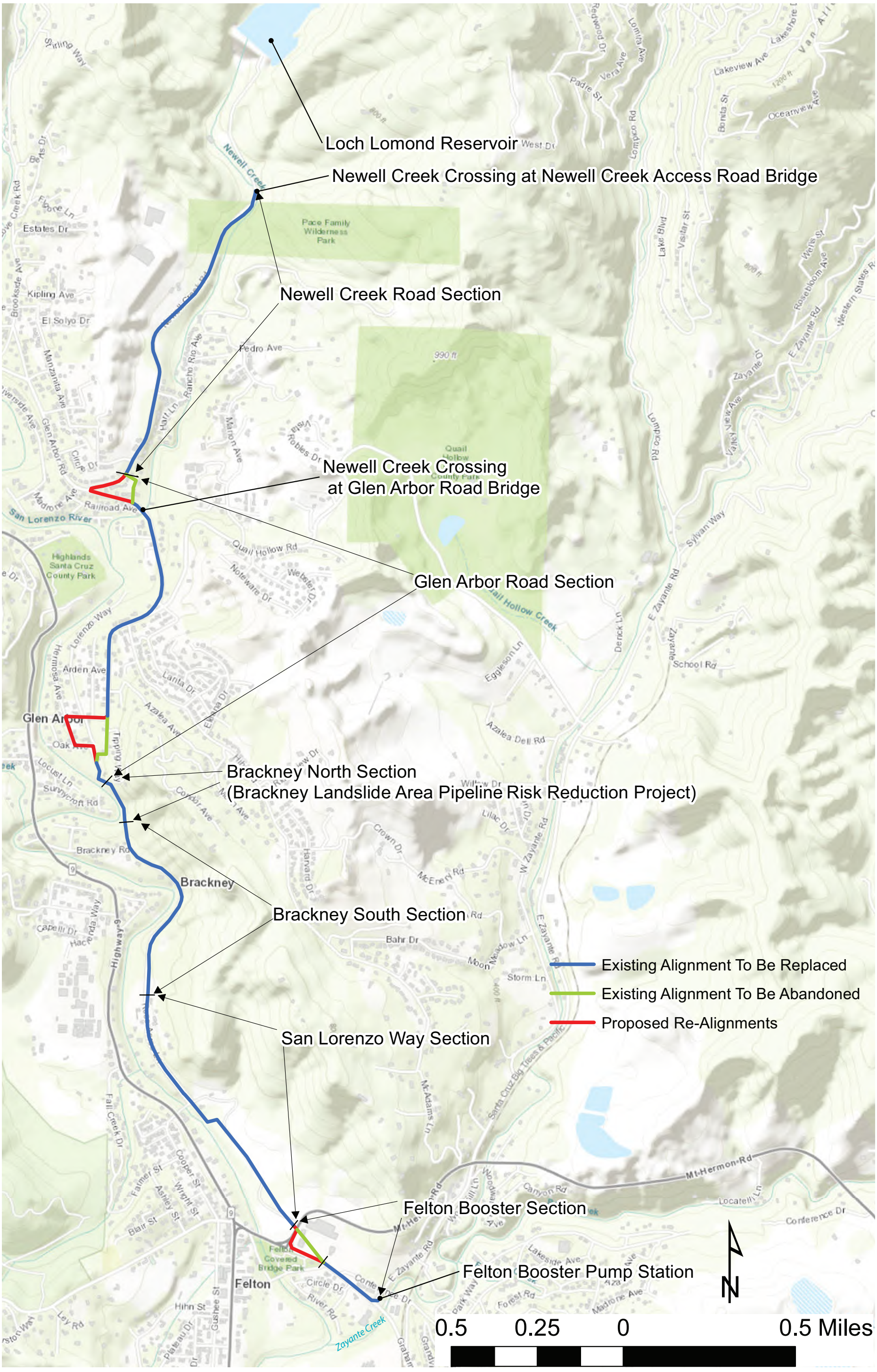


SOURCE: City of Santa Cruz Water Department 2020

FIGURE 2

Proposed Newell Creek Pipeline Improvement Project Overview

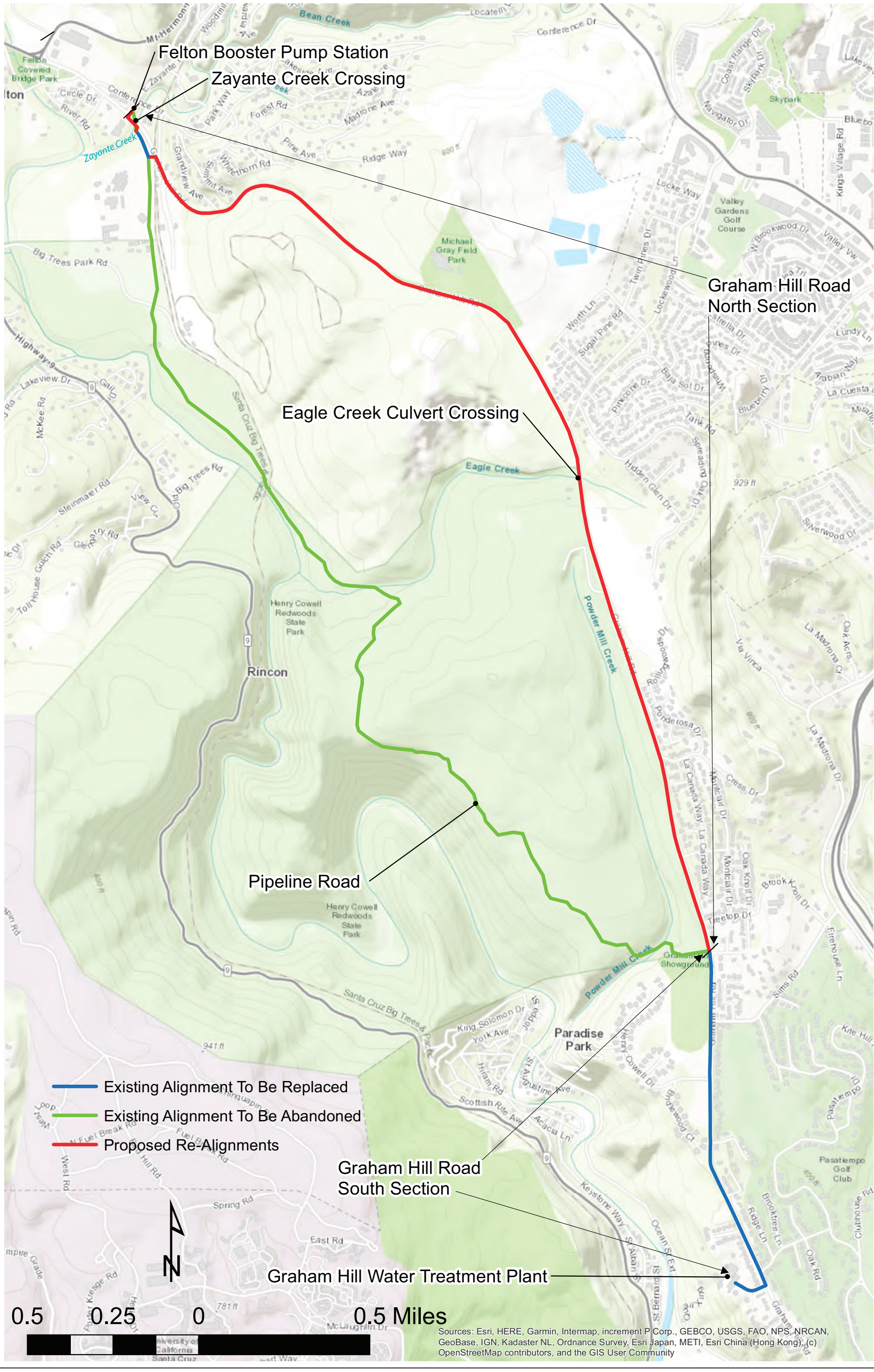
Newell Creek Pipeline Improvement Project



SOURCE: City of Santa Cruz Water Department 2020

FIGURE 3

Proposed Newell Creek Pipeline Improvement Project Northern Segment

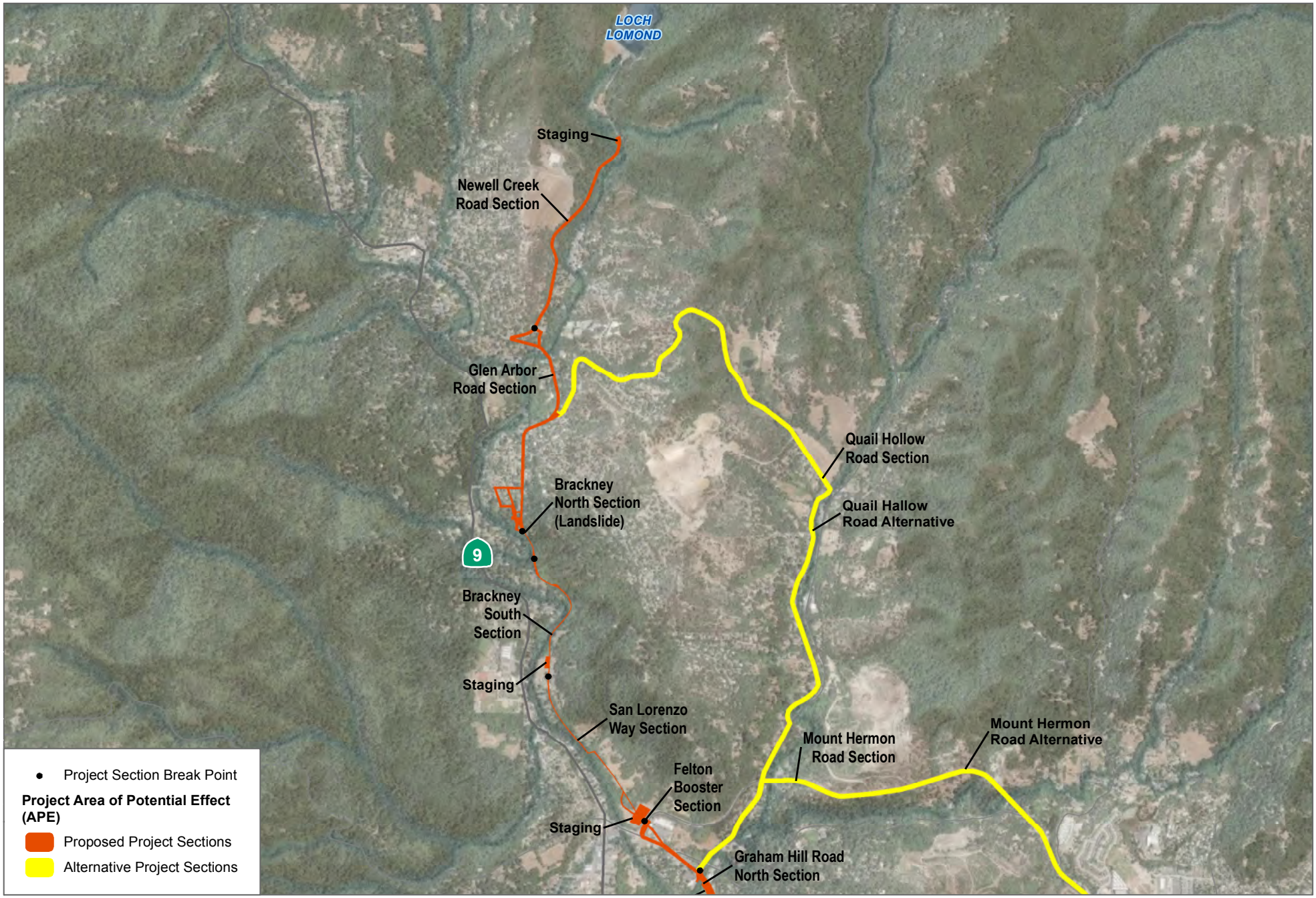


SOURCE: City of Santa Cruz Water Department 2020

FIGURE 4

Proposed Newell Creek Pipeline Improvement Project Southern Segment

DUDEK



SOURCE: ESRI 2021, HDR 2019 County of Santa Cruz 2020, City of Santa Cruz Water Department 2020

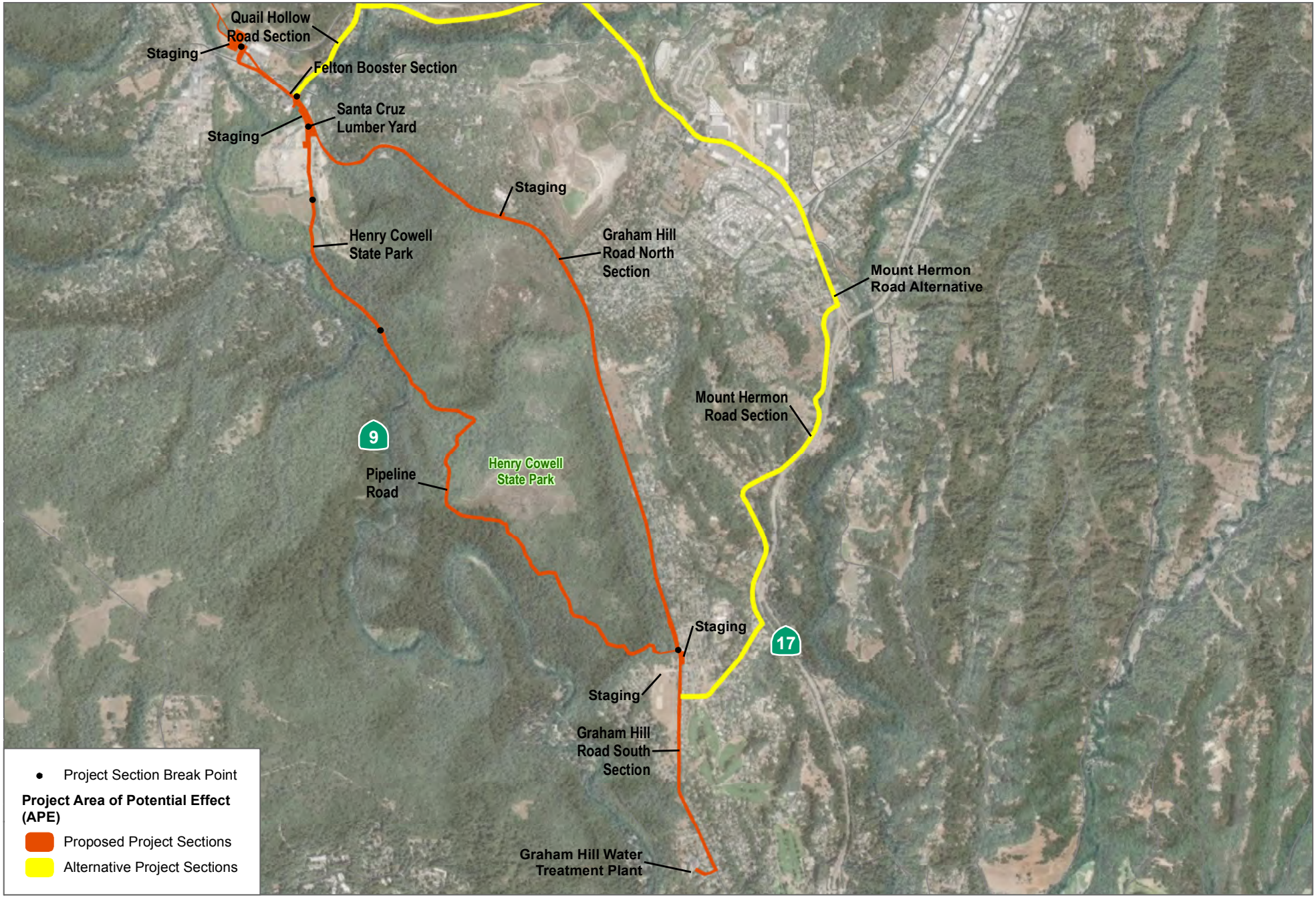
DUDEK

0 1,500 3,000 Feet

FIGURE 5A

Area of Potential Effects (APE) - Northern Segment

Newell Creek Pipeline Improvement Project



SOURCE: ESRI 2021, HDR 2019 County of Santa Cruz 2020, City of Santa Cruz Water Department 2020

DUDEK

0 1,500 3,000 Feet

FIGURE 5B

Area of Potential Effects (APE) - Southern Segment

Newell Creek Pipeline Improvement Project

Appendix A

Confidential Records Search Results

Appendix B

SLF Search and Tribal Correspondence

Appendix C-2

Historical Resources Inventory, Evaluation and Finding of Effect Report

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HISTORICAL RESOURCES INVENTORY, EVALUATION AND FINDING OF EFFECT REPORT FOR THE NEWELL CREEK PIPELINE IMPROVEMENT PROJECT

Prepared for:

CITY OF SANTA CRUZ WATER DEPARTMENT
212 Locust Street, Suite C
Santa Cruz, California 95060
Contact: Doug Valby, PE

Prepared by:

Fallin Steffen, MPS, and Kathryn Haley, MA
DUDEK
725 Front Street, Suite 400
Santa Cruz, California 95060

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
APE	area of potential effects
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information Center
City	City of Santa Cruz
CRHR	California Register of Historical Resources
FBPS	Felton Booster Pump Station
GHWTP	Graham Hill Water Treatment Plant
NCP	Newell Creek Pipeline
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
ROW	right-of-way
SCCHRI	Santa Cruz County Historic Resources Inventory
SPRR	Southern Pacific Railroad

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Executive Summary

The City of Santa Cruz (City) retained Dudek to complete a historical resources inventory and evaluation report (report) for the Newell Creek Pipeline Improvement Project (Proposed Project) to replace 8.75 miles of the existing Newell Creek Pipeline (NCP) located in Santa Cruz County, California with a new 24-inch water main pipeline. To implement the proposed actions, permitting through federal agencies, potentially including, but not limited to, the U.S. Army Corps of Engineers and Federal Emergency Management Agency, may be necessary. Federal agencies are required to comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966. In accordance with the NHPA's implementing regulations, 36 CFR 800.4, the U.S. Army Corps of Engineers requires an inventory of cultural resources within the Project's area of potential effect (APE) in order to determine the presence or absence of historic properties and potential effects upon those properties.

The purpose of this report is to identify all built environment cultural resources within the Project's APE and to determine whether the Project/undertaking would result in a significant impact to an historical resource under the California Environmental Quality Act (CEQA) or an adverse effect to an historic property under Section 106 of the NHPA. Archaeological cultural resources within the Project APE are addressed in the separate *Archaeological Resources Inventory and Evaluation Report for the Newell Creek Pipeline Improvement Project* (Dudek 2021). The preparation of this report included the following components: (1) a California Historical Resources Information System (CHRIS) records search conducted by the Northwest Information Center (NWIC); (2) the development of a Built Environment APE; (3) outreach to local historical societies requesting information about historical resources in the vicinity of the APE; (4) a pedestrian survey of the APE for built environment resources; (5) a historical significance evaluation of four historic era structures within the APE; and (6) an assessment of project-related impacts to historical resources in conformance with CEQA, project effects to historic properties in conformance with Section 106 of the NHPA, and in consideration of applicable local municipal code and planning documents.

Dudek conducted an intensive-level ground pedestrian survey for built environment resources within the APE on December 2, 2020, December 9, 2020, and December 16, 2020. Following review of the CHRIS records and additional background research of the APE Dudek found two built environment structures that required consideration of potential project related adverse effects in the APE. The first structure is the existing NCP and it is the only built environment property requiring formal recordation and evaluation as part of this study. No previous recordation or evaluation of the historic era NCP structure was identified through background research. As such, Dudek recorded and evaluated the NCP under National Register of Historic Places (NRHP) the California Register of Historical Resources (CRHR), and the Santa Cruz County Historic Resources Inventory (SCCHRI) criteria. Dudek recommends that the NCP is ineligible for listing in the NRHP and the CRHR due to a lack of historical associations and engineering merit. For these same reasons, the property also does not rise to the level of significance for local designation in the SCCHRI. Therefore, the Newell Creek Pipeline is not considered an historic property under Section 106 of the NHPA nor an historical resource under CEQA.

The Newell Creek Access Road Bridge is also located within the APE and is considered a contributing feature of the Newell Creek Dam complex, which was determined eligible for the National Register of Historic Places (NRHP) following consultation with the State Historic Preservation Officer (SHPO) in 2019 under Criterion A/1 for its association with important events that have made a significant contribution to the development of water infrastructure in Santa Cruz (COE_2019_0610_002). See Appendix A: Newell Creek Access Road Bridge (Newell Creek Dam Complex Contributor): SHPO concurrence letter and DPR 523 form set.

As the Newell Creek Access Road Bridge is considered a contributing feature of the Newell Creek Dam complex, it is therefore considered a historic property under Section 106 of the NHPA and a historical resource under CEQA. A

detailed CEQA impacts and Section 106 adverse effect assessment is presented as part of this study in Section 5. Dudek recommends a Project finding of a less-than-significant to built environment historical resources under CEQA and no adverse effect to historic properties under Section 106

1 Introduction

This section provides a preliminary description of the proposed Newell Creek Pipeline Improvement Project (Proposed Project), and includes information about the location and setting; existing facilities and operations; background on the Santa Cruz Water Department (referred to herein as City) and the NCP; purpose and objectives; Proposed Project components; construction schedule and activities; operations and maintenance; the City's Standard Construction Practices incorporated into the Proposed Project; and anticipated required permits and/or approvals for the Proposed Project. All project location and project description figures can be found in Appendix B. This section also presents a description of the Built Environment APE, project personnel, and the regulatory setting for the project.

1.1 Project Location and Setting

The existing NCP is located in the Santa Cruz Mountains in the unincorporated area of Santa Cruz County, except for the portion of the NCP that extends onto the City's Graham Hill Water Treatment Plant (GHWTP) property, which is located within the City of Santa Cruz, but is surrounded by unincorporated lands; see Figure 1-1, Project Location, in Appendix B. Both the existing NCP and the Proposed Project extend approximately 9 miles between the GHWTP on the south and Newell Creek Dam, a City facility that impounds Loch Lomond Reservoir, on the north. The existing NCP and Proposed Project alignment are located within a primarily semi-rural area, characterized by forested terrain with rural and semi-rural, low-density residential neighborhoods and limited commercial development; see Figure 2-1, Proposed Newell Creek Pipeline Improvement Project Overview.

The northern segment of the existing pipeline extends from just south of the existing Newell Creek Dam to the Felton Booster Pump Station (FBPS) that is located at the intersection of Graham Hill Road and East Zayante Road. The northern segment is located east of Highway 9 and north of Mount Hermon Road, generally between the unincorporated communities of Felton and Ben Lomond and west of Lompico in the San Lorenzo Valley; see Figure 2-2. Proposed Newell Creek Pipeline Improvement Project Northern Segment. The southern segment of the existing NCP extends from the FBPS to the GHWTP; see Figure 2-3. Proposed Newell Creek Pipeline Improvement Project Southern Segment.

1.2 Existing Facilities

The NCP is a critical component of the City's raw water supply infrastructure. It conveys untreated water to and from the Loch Lomond Reservoir, which is the City's only raw water storage facility. The NCP is critical to supplying the water system during dry seasons as well as during storm events, and also is critical in conveying untreated water from the existing Felton Diversion to the Reservoir for storage. The existing 9.25-mile NCP was constructed in 1960 in conjunction with construction of the Newell Creek Dam. The pipeline material is predominantly concrete cylinder pipe, which is composed of a steel cylinder lined with cement mortar on the interior and is helically wrapped with a mild steel bar or wire and coated with dense cement mortar. The existing NCP includes three creek crossings—two over Newell Creek in the northern segment and one over Zayante Creek in the southern segment—as well as numerous culverted creek and drainage crossings.

The existing pipeline size ranges in diameter from 18 inches to 27 inches, with the majority of the NCP being 20 or 22 inches in interior diameter (HDR 2020). According to the 1960 Construction Specifications, the northern

segment consists of approximately 22,670 linear feet of 22-inch pipeline. The NCP extends south from the toe of Newell Creek Dam and generally follows existing roads through residential neighborhoods, but also extends through undeveloped private property along abandoned railroad bed in the Brackney Road and Rose Acres Lane neighborhoods. The southern NCP segment consists of approximately 3,700 linear feet of 27-inch-diameter, 11,335 feet of 22-inch-diameter, 8,797 feet of 20-inch-diameter, and 1,151 feet of 18-inch-diameter pipeline according to the 1960 Construction Specifications (Santa Cruz Sentinel 1960a: 18; Brown and Caldwell 1960: Sheets 1-2).

1.3 Project Background

There are a number of known concerns regarding the condition and operation of the existing NCP. Generally, the NCP, constructed nearly 60 years ago, is reaching the end of its useful life and is experiencing increased frequency of breaks as a result of corrosion and land movement along portions of its alignment due to geological conditions. There is no functioning cathodic protection system[1] on the NCP, and corrosion has been observed, which presents risks of leaks and failure.

Due to steep terrain and landslides present in some locations, the existing NCP has been damaged and/or is located in areas that make access and repairs difficult. A portion of the existing NCP along Pipeline Road in Henry Cowell Redwoods State Park has the highest recent break history, and several areas of Pipeline Road have washed out, resulting in exposure of the NCP. Another portion of the NCP was constructed in an old railroad bed along a steep hillside in the Brackney area, east of Highway 9 between Felton and Ben Lomond, which includes several landslide hazard areas that could cause stress or breakage of the pipeline as further explained below. Furthermore, some appurtenances, such as isolation valves, are inoperable or are unknown in location, and some portions of the existing pipeline alignment have appurtenant structures (such as fences, retaining walls and sheds) constructed on top of the NCP (HDR 2018).

A major capital improvement at the Newell Creek Dam, consisting of replacement of the dam's inlet/outlet facilities and appurtenances, was approved and permitted in 2019, and construction was initiated in May 2020. It is noted that approximately 2,000 linear feet of the northernmost section of the existing NCP is not part of this Proposed Project. The first phase of the Newell Creek Dam Inlet/Outlet Replacement Project includes replacement of this section of the NCP with a new 30-inch pipeline from the toe of the dam to just upstream of the Newell Creek Access Road Bridge. Construction started in May 2020.

1.4 Project Purpose

The purpose of the Proposed Project is to address the identified deficiencies in existing pipeline conditions, as well as provide improved access for maintenance and repair. As described in Section 1.3 above, having been constructed in approximately 1960, the NCP is reaching the end of its useful life and is experiencing increased frequency of breaks due to corrosion and land movement along portions of its alignment due to geological conditions. In addition to the age of the existing pipeline, development throughout Santa Cruz County over the past

[1] Cathodic protection is a technique used to control the corrosion of a metal surface by making it the cathode of an electrochemical cell. A simple method of protection connects the metal to be protected to a more easily corroded "sacrificial metal" to act as the anode. The sacrificial metal then corrodes instead of the protected metal. For structures such as long pipelines, where passive galvanic cathodic protection is not adequate, an external DC electrical power source is used to provide sufficient current.

60 years has created differing conditions along the NCP alignment from its original installation, which has resulted in constraints to accessing the pipeline for maintenance and repair activities due to intervening private development. Various surface improvements were made as part of the pipeline installation (unpaved access roads, drainage crossings, appurtenant features), which have also experienced nearly 60 years of wear and are in need of replacement and/or rehabilitation.

1.5 Project Components

1.5.1 Project Overview

The Proposed Project consists of replacement of 8.75 miles of the existing NCP with a new 24-inch PVC or high-density polyethylene (HDPE) pipeline, except for one pipe section that will be a 30-inch high-density polyethylene (HDPE) pipe. The pipeline generally would be installed within existing road pavement, road right-of-way (ROW), and/or existing or new City easements. The proposed northern NCP segment from the Newell Creek Access Road Bridge to the FBPS generally follows the existing NCP alignment with a few short re-alignments to avoid crossing private property. Wherever possible, the new pipeline would be installed parallel to the existing pipeline. The proposed southern NCP segment from the FBPS to the GHWTP generally includes a new pipeline section along Graham Hill Road. Figure 2-1 provides an overview of the proposed NCP alignment. Once the new pipeline is installed and the interconnections are made, the existing NCP would be removed or abandoned in place. Key features of the Proposed Project are summarized in Table 1 and further described in Section 1.5.2.

Three pipeline sections have been identified for replacement in the near term: two sections along Graham Hill Road that would replace the existing pipe through Henry Cowell State Park, and the Brackney North section. The engineering design phase for these sections is underway. For the remainder of the pipeline alignment, a conservative project scenario would be installation of the new pipeline within specified corridors as identified in Section 1.5.2.

Table 1. Key Proposed Project Features

Project Feature	Northern Segment Newell Creek Road to FBPS	Southern Segment FBPS to GHWTP
Alignment Length (feet)	21,838	23,745
Number of Creek or River Crossings	3	1
Maximum Elevation (feet above mean sea level)	392	727

Source: HDR 2019a.

1.5.2 Description of Pipeline Segments

1.5.2.1 Northern Segment

The proposed northern NCP segment is planned within the same alignment as the existing pipeline with some minor realignments to avoid private properties. The new pipeline would be installed within existing roadway, road ROWs, and/or City easements. The northern segment has a maximum surface elevation of approximately 392 feet above mean sea level, can gravity flow to the Felton Booster pump station, and has two creek crossings over Newell Creek and over one unnamed tributary. Three short portions of pipe sections are currently under private property and would be rerouted as

described below. There are six distinct sections that comprise the northern segment as discussed below, summarized in Table 2, and shown on Figure 2-2. Further description for each section is provided below.

Table 2. Proposed Project Northern Segment Summary

Section	Section Length (feet)	Pipeline Corridor Width (feet)[1, 2]	Description[3]
Newell Creek Road	5,035	60–100 Open cut trench	Runs along Newell Creek Road from the Newell Creek Access Road Bridge to the intersection where the pipeline passes between homes and connects at Glen Arbor Road. *Creek Crossing: Newell Creek*
Glen Arbor Road	5,120	40–100 Open cut trench	Continues along Newell Creek Road turning onto Glen Arbor Road, crossing Newell Creek, turning onto Hermosa Avenue, Oak Avenue, and Fremont Avenue to north end of Brackney Road. *Creek Crossing: Newell Creek*
Brackney North (Brackney Landslide Area Pipeline Risk Reduction Project)	2,611	10 Trenchless	Runs along an abandoned railroad bed alongside the San Lorenzo River between a Glen Arbor Road neighborhood and the Brackney Road neighborhood
Brackney South	2,860	10 Open cut trench and/or trenchless	Extends from Brackney North section, partially along unpaved easement and paved road and ends at a property boundary at north end of San Lorenzo Way/Rose Acres Lane.
San Lorenzo Way	4,242	10 Open cut trench	Runs from north to south end of San Lorenzo Way/Rose Acres Lane and through private property to the edge of Mount Hermon Road. *Creek Crossing: Unnamed creek that is likely tributary to San Lorenzo River*
Felton Pump Station	1,970	60–120 Open cut trench	Runs along Mount Hermon Road and Graham Hill Road to Felton Pump Station.
Total	22,492		

Sources: HDR 2020; City of Santa Cruz 2017.
Notes:
1 Includes area in which new pipeline could be located and area of disturbance during pipeline installation. Construction method is identified.
2 Pipeline location to be specified in 10%–30% design plans. Construction activities would require temporary disturbance outside of the 10-foot easement for the boring and receiving pits.
3 Sections where pipeline crosses a creek are noted.

1.5.2.2 Southern Segment

The southern segment of the proposed NCP extends from the FBPS to the GHWTP and generally consists of a new 24-inch pipeline constructed within the Graham Road ROW and replacement of the southernmost section of existing pipeline located in Graham Hill Road as shown on Figure 2-3 and summarized on Table 3. The paved roadway width of Graham Hill Road varies between 28 and 40 feet in a 40- to 120-foot-wide ROW. This alignment would replace the existing NCP Santa Cruz Lumber Yard section, and the Henry Cowell State Park and Pipeline Road sections through Henry Cowell Redwoods State Park.

Table 3. Proposed Project NCP Southern Segment Summary

Segment Section	Section Length (feet)	Pipeline Corridor Width (feet)[1, 2]	Description[3]
Graham Hill Road North	17,880	40–100 Open cut trench (except for creek crossing)	From Felton Pump Station, crosses Zayante Creek, runs alongside Graham Hill Road, crosses railroad tracks entering Graham Hill Road and follows Graham Hill Road to southern entrance of Henry Cowell Redwoods State Park. *Creek Crossing: Zayante Creek*
Graham Hill Road South	5,865	65–120 Open cut trench	Follows Graham Hill Road from southern entrance of Henry Cowell Redwoods State Park to GHWTP.
Total	**23,745**		

Sources: HDR 2020; City of Santa Cruz 2017.
Notes:
1 Includes area in which new pipeline could be located and area of disturbance during pipeline installation. Construction method is identified.
2 Pipeline location to be specified in 10%–30% design plans.
3 Sections where pipeline crosses a creek are noted.

The southern segment has a maximum elevation of approximately 727 feet above mean sea level, one creek crossing at Zayante Creek and two culverted creek crossings (Eagle Creek and Powder Hill Creek), and requires no new pump station. The bridge crossing over Zayante Creek has a 3-foot-wide raised pedestrian crossing on one side of the bridge; the existing Felton Diversion pipeline crossing is located on the west side of the bridge (HDR 2020).

1.5.3 Other Project Components

1.5.3.1 Appurtenances and Improvements

Other components of the Proposed Project include installation of air release valves that extend approximately 24 inches above ground. Existing air valves will be replaced, and new air valves will be required in new pipeline sections in locations to be determined during design. The FBPS has been improved over the past decade, and no new pump stations are required. No other improvements or appurtenances have been identified for the Proposed Project.

1.5.3.2 Post-Construction Revegetation/Restoration

Upon completion of construction, construction sites would be revegetated and/or restored in accordance with the City's standard construction practices, and disturbed roadways would be repaved in accordance with County requirements.

1.5.3.3 Decommissioning of Existing Pipeline

Once the new NCP pipeline sections are completed and operational, the existing pipeline sections would be decommissioned. This would involve capping off the existing pipeline and injecting the pipeline with grout. With the decommissioning of existing NCP sections, existing fire hydrants along Pipeline Road in Henry Cowell Redwoods State Park also would be abandoned. All above-grade appurtenances along the abandoned pipeline would be completely removed.

1.6 Project Construction

The Proposed Project is scheduled to be constructed in phases over multiple years from approximately 2023 to 2032. The Brackney North, Graham Hill Road North, and Graham Hill Road South pipe sections would be constructed first, with an estimated construction schedule of about 24 months for the Graham Hill Road sections and approximately 9 months for the Brackney North section, including pipeline installation, road repaving, abandonment of the existing NCP, and post-construction revegetation where needed. The remaining pipe sections in the northern segment are expected to be constructed by 2032. For sections of the pipeline that are installed using standard trenching techniques, it is expected that approximately 60 to 100 linear feet of new pipeline would be installed per day on average.

The majority of the Proposed Project would be installed using conventional (open cut) trenching methods. Special construction techniques may be utilized in the Brackney area and for creek crossings. As indicated in section 1.5.1, the Proposed Project generally would be constructed within existing road pavement, road ROW and/or existing and new City easements.

Conventional (open cut) trenching would use excavators and loaders. The standard pipeline construction trench would be approximately 4 to 5 feet wide and 5 feet deep, minimum. Construction activities would be expected to occur within an approximate 10-foot-wide to 15-foot-wide construction corridor, which includes the area of trenching and placement of equipment.

Installation of a new pipe in the Brackney North section would involve installation using mostly trenchless and open cut trenching methods. The new pipe in the Brackney North section would be installed using the horizontal directional drilling (HDD) method, which is a guided trenchless construction technique.

The Proposed Project includes four open creek crossings and numerous culverted creek and drainage crossings. The actual method/design will be developed as part of future engineering design plans for the pipeline sections with creek crossings. However, it is expected that the pipeline will be attached to the two Newell Creek bridges as currently exist and will be installed above Zayante Creek adjacent to the existing Felton Diversion pipeline.

The City has adopted standard construction practices, presented in this section, that would be implemented by the City or its contractors during construction activities associated with the Proposed Project, where relevant. Standards 24 and 25 relate to cultural resources:

24. Any unrecorded archaeological resources (sites, features, and/or artifacts) exposed during construction are subject to protection and consideration under CEQA and the California Public Resources Code (PRC) as well as Section 106 of the National Historic Preservation Act (NHPA) as detailed in the Code of Federal Regulations (CFR). The CEQA Guidelines Section 15064.5(f) specifically addresses provisions the City of Santa Cruz will make regarding accidental discovery of historical or unique archaeological resources during construction. The responsibilities of the lead federal agency to avoid, minimize or mitigate adverse effects to a "historic property" (36 CFR Section 800.16) are detailed in 36 CFR Section 800.13[b] and would be applicable for a project with federal involvement by way of funding, permitting, approval authority, or other means.

In general, the implementation procedures under CEQA and the NHPA in the case of an inadvertent archaeological discovery during construction are similar and are as follows:

- If archaeological resources are exposed immediately stop any construction work occurring within 100 feet which may further disturb the find. NOTE – This is a general guideline for the initial response, the exclusion zone may be contracted or expanded depending on the nature of discovery and type of construction activity proposed in the vicinity of the find. The duration of the exclusion zone will be determined by the City and the federal lead agency and is contingent on the approved course of action in response to the discovery.
- Immediately notify the City Project Manager who shall immediately notify the Water Department Deputy Director/Engineering Manager
- A qualified archaeologist meeting the Secretary of the Interior's Professional Qualification Standards will evaluate the state and federal significance of the find for eligibility to the California Register of Historical Resources (CRHR) and the National Register of Historic Places (NRHP) in coordination with City staff.
- The City will notify the lead federal agency within 24 hours of discovery. The notification shall describe the assessment of the NRHP eligibility of the resource, specify the NRHP criteria used to evaluate the property's eligibility, and propose actions to resolve any adverse effects.
- The federal lead agency will contact the State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP), and any interested locally affiliated Native American tribes. The SHPO, ACHP, and Native American tribes will respond within 48 hours of the notification. The federal lead agency shall consider any recommendations regarding National Register eligibility and proposed actions and notify the City of the appropriate actions. The federal lead agency official shall provide the SHPO and the ACHP a report of the actions when they are completed.
- Avoidance and/or minimization of impacts/effects is the preferred course of actions under both state and federal guidelines. If preservation in place is not feasible, additional study will likely be required. In coordination with the lead federal agency, the City will prepare a data recovery/treatment plan for retrieving important archaeological data relevant to the site's significance. The data recovery/treatment plan will be submitted to participating tribes and agencies for review and comment prior to implementation.
- If the inadvertent discovery location cannot be avoided, and continuing work would have an adverse effect on the site, the federal agency, in coordination with the City, SHPO, and Native American tribes as appropriate, will need to draft and finalize a Memorandum of Agreement for the treatment of the historic property before work can proceed.
- Implementation of the data recovery/treatment plan may include archaeological excavations, technical and laboratory analysis, and further consultation and coordination with Native American tribal representatives.
- A full written report will be prepared to include the results of all technical analyses and special studies and will be provided to participating tribes and agencies for review and comment. The report will be filed with the Northwest Information Center and will also provide for the permanent curation of recovered materials.

25. In California, the illegal possession of human remains is a felony, punishable by imprisonment (California Penal Code Section 1170[h]; Public Resources Code 5097.99[a] and [b]). Inadvertent discoveries of human remains exposed during construction on non-federal lands are subject to protection under CEQA and the NHPA. In accordance with Section 7050.5 of the California Health and Safety Code and the NHPA, if potential human remains are found, immediately notify the City, the lead federal agency, and the Santa Cruz County Coroner of the discovery. The Santa Cruz County Coroner will provide a determination within 48 hours of notification. No further excavation or disturbance of the identified material, or any area reasonably suspected to overlie additional remains, can occur until a determination has been made.

    - If human remains are exposed immediately stop any construction work occurring within 100 feet which may further disturb the find. NOTE – This is a general guideline for the initial response, the exclusion zone may be contracted or expanded depending on the nature of discovery and type of construction activity proposed in the vicinity of the find. The duration of the exclusion zone is contingent on the course of action mandated by the City and lead federal agency.
    - If the Santa Cruz County Coroner determines that the remains are, or are believed to be, Native American, the coroner will notify the Native American Heritage Commission (NAHC) within 24 hours and all the actions described in these Standard Construction Practices regarding Inadvertent Archaeological Discoveries shall be followed.
    - In accordance with California Public Resources Code, Section 5097.98 and Section 106 of the NHPA, the NAHC must immediately notify those persons it believes to be the Most Likely Descendant (MLD) from the deceased Native American.
    - Within 48 hours of this notification, the MLD will recommend to the City and lead federal agency her/his preferred treatment of the remains and associated grave goods.
    - The ultimate disposition of the remains will be coordinated between the City, the federal agency, the MLD, the landowner, and the NAHC (if necessary).
    - The lead federal agency will have additional government-to-government consultation requirements per the requirements of Section 106 [36 CFR § 800.2(c)(2)(ii)] which cannot be delegated to non-federal entities.

1.7 Built Environment Area of Potential Effect

The area of potential effect, or APE, is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties. Determination of the APE is influenced by a project's setting, the scale and nature of the undertaking, and the different kinds of effects that may result from the undertaking (36 CFR 800.16[d]).

The Built Environment APE, presented in Figures 3-1 through 3-5 provided in Appendix B, Built Environment Area of Potential Effects follows the maximum possible area of potential effects resulting from the Proposed Project, including all construction activities that will be confined to the public ROW within the limits of work for the Project. As shown in these figures, the built environment APE is limited to the extent of the project footprint illustrated as the Proposed Project Section (orange) and Alternative Project Sections (yellow). Any new disturbances or easements/property takes within the area surrounding the APE will require further study to determine potential adverse effects.

Only one built environment cultural resource over the age of 45 required formal recordation and significance evaluation in the APE. This resource is the NCP and the associated infrastructure components such as wharf hydrants and vents which accompany the structure. Details on this resource are presented in this study.

The City owns and maintains the Newell Creek Access Road Bridge, a bridge located on Newell Creek Road just south of the Newell Creek Dam within the Project APE. The bridge is considered a contributing feature of the Newell Creek Dam complex, which was designed by engineers Creegan and D'Angelo and completed by contractors Williams and Burrows Inc. in 1960. The Newell Creek Dam and its associated features were determined eligible in 2019 under Criterion A/1 eligible for local listing under Santa Cruz County Criterion 2 for its contribution to the broad patterns of our history because of its association with important events that made a significant contribution to the development of water infrastructure in Santa Cruz. These important events include concerns over local water shortages in the late 1950s (as documented in state and local water supply reports) leading up to the passage of the Water Revenue Bond in 1958, which approved funding for construction of the Newell Creek Dam in direct response to concerns over water shortages, and also that water shortages in the late 1950s threatened to make Santa Cruz a less than desirable choice for the location of the next University of California campus in the early 1960s (Dudek 2018).

Other resources over the age of 45 years of age are located in the APE but will not be adversely affected by Project construction or implementation. As such, the following railroad segments, road segments, and bridges (see section 2.2 for description of bridges within but not impacted by the APE) which are not known to be previously evaluated, were not formally recorded or evaluated in this study. A section of the Santa Cruz and Felton Railroad is present within the APE where it briefly transects the planned path of the pipeline. Several roads also run parallel with or briefly transect the Project APE, including Graham Hill Road, Mt. Herman Road, Glen Arbor Road, numerous small county roads, as well as several private and local agency bridges (see Section 2.2 Additional Research on Built Environment Resources in the APE). These structures are not associated with the NCP as they maintain distinct development histories. Most importantly, the Proposed Project does not include any actions related to the realignment or replacement of these structures. Roadwork proposed within the APE as part of the Project implementation will not result in a change of use for the road or any other transecting resource, nor will the work impact the alignment of the structures. Resurfacing of roadways to the extent required for the implementation of the Proposed Project does not extend beyond that which has already taken place as part of the installation of utilities along these throughfares at multiple stages in the past. As such, there is no potential for these resources to be affected by the Proposed Project. As there is no possibility that resources beyond the NCP will be affected by the proposed undertaking, these additional resources are not included in the APE. These resources were therefore not evaluated for historic significance under NRHP, CRHR or SCCHRI criteria as a part of this report.

1.8 Project Personnel

This report, including fieldwork, research, and property significance evaluations, was prepared by Dudek Architectural Historian Fallin Steffen, MPS, and Senior Architectural Historian, Katherine Haley, MA. Resumes for all key personnel are provided in Appendix C.

1.9 Regulatory Setting

This study was completed in compliance with federal cultural resources laws and regulations, including Section 106 of the NHPA. Under Section 106, historic and archaeological districts, sites, buildings, structures, and objects are assigned significance based on their exceptional value or quality in illustrating or interpreting history, architecture, archaeology, engineering, and culture. A number of criteria are used in demonstrating resource importance and are described below.

1.9.1 Federal

The NHPA established the NRHP and the President's Advisory Council on Historic Preservation (ACHP), and provided that states may establish State Historic Preservation Officers to carry out some of the functions of the NHPA. Most significantly, for federal agencies responsible for managing cultural resources, Section 106 of the NHPA directs that

> [t]he head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP.

Section 106 also affords the ACHP a reasonable opportunity to comment on the undertaking (16 U.S.C. 470f).

Title 36 of the Code of Federal Regulations, Part 800 (36 CFR 800) implements Section 106 of the NHPA. It defines the steps necessary to identify historic properties (those cultural resources listed in or eligible for listing in the NRHP), including consultation with federally recognized Native American tribes to identify resources with important cultural values; to determine whether or not they may be adversely affected by a proposed undertaking; and the process for eliminating, reducing, or mitigating the adverse effects.

The content of 36 CFR 60.4 defines criteria for determining eligibility for listing in the NRHP. The significance of cultural resources identified during an inventory must be formally evaluated for historic significance in consultation with the ACHP and the California State Historic Preservation Officer to determine if the resources are eligible for inclusion in the NRHP. Cultural resources may be considered eligible for listing if they possess integrity of location, design, setting, materials, workmanship, feeling, and association.

Regarding criteria A through D of Section 106, the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, cultural resources, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that (36 CFR 60.4):

A. Are associated with events that have made a significant contribution to the broad patterns of our history; or
B. Are associated with the lives of persons significant in our past; or

C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. have yielded or may be likely to yield, information important in prehistory or history.

The 1992 amendments to the NHPA enhance the recognition of tribal governments' roles in the national historic preservation program, including adding a member of an Indian tribe or Native Hawaiian organization to the ACHP.

The NHPA amendments:

> Clarify that properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization may be determined eligible for inclusion in the National Register
>
> Reinforce the provisions of the Council's regulations that require the federal agency to consult on properties of religious and cultural importance.

The 1992 amendments also specify that the ACHP can enter into agreement with tribes that permit undertakings on tribal land and that are reviewed under tribal regulations governing Section 106. Regulations implementing the NHPA state that a federal agency must consult with any Indian tribe that attaches religious and cultural significance to historic properties that may be affected by an undertaking.

1.9.2 State

1.9.2.1 California Register of Historical Resources

In California, the term "historical resource" includes but is not limited to "any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California" (California Public Resources Code Section 5020.1(j)). In 1992, the California legislature established the California Register of Historical Resources (CRHR) "to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (California Public Resources Code Section 5024.1(a)). The criteria for listing resources on the CRHR were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP, enumerated below. According to California Public Resources Code Section 5024.1(c)(1–4), a resource is considered historically significant if it (i) retains "substantial integrity," and (ii) meets at least one of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

(2) Is associated with the lives of persons important in our past.

(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

(4) Has yielded, or may be likely to yield, information important in prehistory or history.

In order to understand the historic importance of a resource, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource less than 50 years old may be

considered for listing in the CRHR if it can be demonstrated that sufficient time has passed to understand its historical importance (see 14 CCR 4852(d)(2)).

The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP, and properties listed or formally designated as eligible for listing in the NRHP are automatically listed in the CRHR, as are the state landmarks and points of interest. The CRHR also includes properties designated under local ordinances or identified through local historical resource surveys.

1.9.2.2 California Environmental Quality Act

As described further below, the following CEQA statutes and CEQA Guidelines are of relevance to the analysis of archaeological, historic, and tribal cultural resources:

- California Public Resources Code Section 21083.2(g) defines "unique archaeological resource."
- California Public Resources Code Section 21084.1 and CEQA Guidelines Section 15064.5(a) define "historical resources." In addition, CEQA Guidelines Section 15064.5(b) defines the phrase "substantial adverse change in the significance of an historical resource." It also defines the circumstances when a project would materially impair the significance of an historical resource.
- California Public Resources Code Section 21074(a) defines "tribal cultural resources."
- California Public Resources Code Section 5097.98 and CEQA Guidelines Section 15064.5(e) set forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony.
- California Public Resources Code Sections 21083.2(b)-(c) and CEQA Guidelines Section 15126.4 provide information regarding the mitigation framework for archaeological and historic resources, including examples of preservation-in-place mitigation measures; preservation-in-place is the preferred manner of mitigating impacts to significant archaeological sites because it maintains the relationship between artifacts and the archaeological context and may also help avoid conflict with religious or cultural values of groups associated with the archaeological site(s).

More specifically, under CEQA, a project may have a significant effect on the environment if it may cause "a substantial adverse change in the significance of an historical resource" (California Public Resources Code Section 21084.1; CEQA Guidelines Section 15064.5(b).) If a site is either listed or eligible for listing in the CRHR, or if it is included in a local register of historic resources or identified as significant in a historical resources survey (meeting the requirements of California Public Resources Code Section 5024.1(q)), it is a "historical resource" and is presumed to be historically or culturally significant for purposes of CEQA (California Public Resources Code Section 21084.1; CEQA Guidelines Section 15064.5(a)). The lead agency is not precluded from determining that a resource is a historical resource even if it does not fall within this presumption (California Public Resources Code Section 21084.1; CEQA Guidelines Section 15064.5(a)).

A "substantial adverse change in the significance of an historical resource" reflecting a significant effect under CEQA means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (CEQA Guidelines Section 15064.5(b)(1); California Public Resources Code Section 5020.1(q)). In turn, CEQA Guidelines section 15064.5(b)(2) states the significance of an historical resource is materially impaired when a project:

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

Pursuant to these sections, the CEQA inquiry begins with evaluating whether a project site contains any "historical resources," then evaluates whether that project will cause a substantial adverse change in the significance of a historical resource such that the resource's historical significance is materially impaired.

If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that they cannot be left undisturbed, mitigation measures are required (California Public Resources Code Section 21083.2[a], [b], and [c]).

California Public Resources Code Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

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

Impacts to non-unique archaeological resources are generally not considered a significant environmental impact (California Public Resources Code section 21083.2(a); CEQA Guidelines Section 15064.5(c)(4)). However, if a non-unique archaeological resource qualifies as tribal cultural resource (California Public Resources Code Section 21074(c), 21083.2(h)), further consideration of significant impacts is required. CEQA Guidelines Section 15064.5 assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. As described below, these procedures are detailed in California Public Resources Code Section 5097.98.

1.9.3 Local – Santa Cruz County

1.9.3.1 Santa Cruz County Historic Resources Inventory

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

- *Historic Resource* is defined in Chapter 16.42.030 (I) as

  …any structure, object, site, property, or district which has a special historical, archaeological, cultural or aesthetic interest or value as part of the development, heritage, or cultural characteristics of the County, State, or nation, and which either has been referenced in the County General Plan, or has been listed in the historic resources inventory adopted pursuant to SCCC 16.42.050 and has a rating of significance of NR-1, NR-2, NR-3, NR-4, or NR-5 (County Code 16.42.030 (I) [Ord. 5061 § 28, 2009; Ord. 4922 § 1, 2008]).

- *Historic District* is defined in Chapter 16.42.30 (E) as

  "…an area designated as a historic resource and which contains improvements that:

  1. Have character of special historic or aesthetic interest or value; and
     - Represent one or more periods or styles of architecture typical of one or more eras in the history of the County; and
     - Cause such area, by reason of these factors, to constitute a geographically definable area possessing a significant concentration or continuity of sites, buildings, structures, or objects that are unified by past events, or aesthetically by plan or physical development (County Code 16.42.030 (E) [Ord. 5061 § 28, 2009; Ord. 4922 § 1, 2008])."

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

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

  (B) Rating of Significance. For purposes of administering the historic preservation program, general public information, and to aid in the nomination of historic resources to the National Register, designated historic structures, objects, sites and districts shall be assigned a National Register (NR) Rating Code for historic significance based upon guidelines published by the United States Department of the Interior, National Park Service as follows:

  (1) NR-1. A property listed in the National Register of Historic Places.

  (2) NR-2. A property that has been determined to be eligible for listing on the National Register by the U.S. Department of the Interior.

  (3) NR-3. A property eligible, in the opinion of the County Historic Resources Commission, to be listed on the National Register of Historic Places.

(4) NR-4. Property which may become eligible for listing on the National Register if additional research provides a stronger statement of significance, or if the architectural integrity is restored. These buildings have either high architectural or historic significance, but have a low rating in the other categories.

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

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

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

(1) The resource is associated with a person of local, State, or national historical significance.

(2) The resource is associated with an historic event or thematic activity of local, State, or national importance.

(3) The resource is representative of a distinct architectural style and/or construction method of a particular historic period or way of life, or the resource represents the work of a master builder or architect or possesses high artistic values.

(4) The resource has yielded, or may likely yield, information important to history.

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2 Research and Field Methods

The following section summarizes Dudek's efforts to identify built environment cultural resources in the APE. Efforts included a records search, property specific research, efforts are summarized below.

2.1 CHRIS Records Search

To identify cultural resources potentially affected by the Project, the City requested a records search for known resources and technical reports from the NWIC of the CHRIS on April 3, 2020 (NWIC File No. 19-1522). The City defined a records search study area that includes the APE, all alternative alignments, and a 0.25-mile buffer from the APE and alternative alignments for previously recorded resources and technical reports. The records search also included a review of the NRHP, the CRHR, the California Points of Historical Interest list, the California Inventory of Historic Resources, the California Historic Landmarks list, historical maps including rancho plat maps, and local inventories. The results are presented in Sections 2.1.1 and 2.1.2 below and in Confidential Appendix D of this report.

2.1.1 Previously Conducted Cultural Resources Studies

The records search results included 168 previously conducted studies within the 0.25-mile study area. Of those 168 reports, 22 have project areas that intersect the APE, and thus relate directly to the Project. The 22 reports are summarized in the stand-alone Archaeological Resources Inventory and Evaluation Report Study prepared for the Proposed Project by Dudek in conjunction with this report (Dudek 2021). Of these 22 previously conducted cultural resource studies, 3 address and record built environment resources in detail within their respective project areas. These reports are summarized below. The results of the records search are presented in Confidential Appendix D of this report.

S-16692 and S-16692a

Cartier (1994) surveyed 130 acres of land for two housing projects in the area east of the San Lorenzo River and north of Graham Hill Road in Felton (S-16692). The larger 115-acre western section of the survey area includes the FBPS and approximately 0.4 miles of the APE. Cartier reported finding prehistoric items including a Monterey banded chert flake and a possible mano near a spring, and historical period remains including a picket fence with square nails in the northwest portion of the property, ceramics, a logging road, and evidence of logging activities. All the found resources were located east of the APE. The smaller 15-acre eastern section does not intersect the APE. Cartier retuned to the property in 1995 and conducted subsurface testing where evidence of resources had been found (S-16692a). Additional historical research on the ownership history of the property was also presented at that time (S-16692a Appendix B). Two test units were excavated in the 115-acre parcel approximately 600 feet east of the APE. Both test units were uniformly negative for cultural resources (Cartier et al. 1995).

S-22415 and S-22415a

Archaeological Consulting conducted a phase I cultural resources investigation (Doane and Haversat 1999) for a proposal to construct improvement to the Mount Hermon Christian Conference Center east of the Felton Covered Bridge (S-22415). The extreme western portion of the investigation study area includes approximately 0.17 miles of the APE and a staging area along the east site of Graham Hill Road from East Zayante Road to Roaring Camp Road. No resources were reported near the APE. A phase II historical report (S-22415a) that came out of phase I investigation was focused on the historic site of the Redwood Camp Sawmill and the extant Southern Pacific Depot located approximately 0.4 miles northeast of the APE. The report concludes that the Southern Pacific Depot building

retains a high degree of historic integrity and appears to be individually eligible for the SCCHRI. The resource (see resource number P-44-000971 in Table 4 below) was assigned a CRHR status code of *5S2, Individual property that is eligible for local listing or designation*. This resource is located outside the APE.

S-28447, S-28447a, S-28447b, and S-28447c

S-28447 is a Historic Properties Survey Report for a 0.64-mile segment of Graham Hill Road (Kelley 2004a) for a roadway safety improvement project. All of the study area is located within the APE and includes the ROW of Graham Hill Road from just west of Roaring Camp Road to a point on Graham Hill Road approximately 3,700 feet east of Roaring Camp Road. The report included a phase I archaeological investigation (S-28447a) that was negative for archaeological resources (Kelley 2004b). The second technical report (S-28447b) is a historical resource evaluation of built environment resources (Marvin 2004). The report presents a historical context, description of five resources, and a formal evaluation of five resources potentially impacted by the project with DPR 523 Series Forms for each resource. All five buildings were found to be not eligible for the NRHP and for the purposes of CEQA. The project concurrence letter from the State Historic Preservation Office (S-28447c) is dated April 5, 2004.

2.1.2 Previously Recorded Cultural Resources

The records search revealed 34 previously recorded cultural resources within the record search study area. Five previously recorded cultural resources (all built environment resources) intersect the APE and 29 recorded resources are located within the study area buffer outside the APE. The five resources located within the APE have been previously found ineligible, so there is no potential for adverse effect.

Table 4. Previously Recorded Cultural Resources Within the Records Search Area

Primary Number	Trinomial	Resource Name/ Description	Age	Year (Recorded By)	NRHP/CRHR Eligibility Status	Proximity to APE
Resources within the APE						
P-44-000546	—	No. 1; 5300 Graham Hill Road/Building	Historic	2003 (Judith Marvin, LSA Associates Inc.)	6Y	Intersects
P-44-000547	—	No. 2; 5300 Graham Hill Road Shed; Other - Belz Equipment Shed/ Building	Historic	2003 (Judith Marvin, LSA Associates Inc.)	6Y	Intersects
P-44-000548	—	No. 3; 34 Summit Avenue/ Building	Historic	2003 (Judith Marvin, LSA Associates Inc.)	6Y	Intersects
P-44-000549	—	No. 4; 5125 Graham Hill Road/Building	Historic	2003 (Judith Marvin, LSA Associates Inc.)	6Y	Intersects
P-44-000550	—	No. 5; 5300 Graham Hill Road/Building	Historic	2003 (Judith Marvin, LSA Associates Inc.)	6Y	Intersects

Table 4. Previously Recorded Cultural Resources Within the Records Search Area

Primary Number	Trinomial	Resource Name/ Description	Age	Year (Recorded By)	NRHP/CRHR Eligibility Status	Proximity to APE
Resources within the 0.25-mile Record Search Buffer						
P-44-000038	CA-SCR-000032	Camp Mitchell/ Site	Prehistoric	1950 (DWL, WJW); 1974 (Jean Stafford, Don Stafford, Cabrillo College); 1984 (Basin Research Associates)	Unknown	Outside
P-44-000083	CA-SCR-000078	Part of old Cowell Estate/ Site	Prehistoric	1972 (Allan Lonnberg); 1984 (Basic Research Associates)	Unknown	Outside
P-44-000092	CA-SCR-000088/H	J.J. Graham Peat Bog; Other - Paul Sweet Tannery/ Site	Prehistoric, Historic	1974 (Jean Stafford, [none])	Unknown	Outside
P-44-000116	CA-SCR-000112/H	Stafford - 3/9/75; Other - Historical Stage Stop/ Site	Prehistoric, Historic	1976 ([none], Scotts Valley Historical Society)	Unknown	Outside
P-44-000165	CA-SCR-000162	GH-1/Site	Prehistoric	1985 ([none], Basin Research Associates)	Unknown	Outside
P-44-000209	CA-SCR-000207H	Felton Covered Bridge/ Structure	Historic	1975 (Jean & Don Stafford); 1984 (Basin Research); 2002 (Foley, Connolly, Gorham, Bowen, Peebles, Edwards, Cabrillo College Archaeological Technology Program)	1S	Outside
P-44-000210	CA-SCR-000208H	Felton Presbyterian Church/Building	Historic	1977 (Mrs. Edith E. Fikes, Faye G. Belardi Board of Trustees);	1S	Outside
P-44-000237	CA-SCR-000235	SV-1; Other - P-6/ Site	Prehistoric	1979 (J. Cooper, Cabrillo College); 1984 (Basin Research Associates)	Unknown	Outside
P-44-000289	CA-SCR-000312H	Quail Hollow/Building, Structure, Site	Historic	1995 (Lynne Eckert, Archaeological Resource Management)	6Y	Outside
P-44-000320	CA-SCR-000134	No Name/ Site	Prehistoric	1973 (T. Buckman, M. Furley); 1984 (Basin Research Associates)	Unknown	Outside

Table 4. Previously Recorded Cultural Resources Within the Records Search Area

Primary Number	Trinomial	Resource Name/ Description	Age	Year (Recorded By)	NRHP/CRHR Eligibility Status	Proximity to APE
P-44-000401	CA-SCR-000329H	OC-9, MC-9; Other - Highway 9 (Santa Cruz County)/ Structure, Site, Other	Historic	1999 (J. Berg, S. Mikesell, FWARG, JRP)	Unknown	Outside
P-44-000402	CA-SCR-000330H	OC-17, MC-17; Highway 17/ Structure, Other	Historic	1999 (L. Leach-Palm, S. Mikesell, FWARG, JRP)	Unknown	Outside
P-44-000409	CA-SCR-000336H	The Castle Property/Site	Historic	1999 (Larry Bourdeau, Pacific Museum Consultants)	Unknown	Outside
P-44-000439	CA-SCR-000338	The Walgreens Site/Site	Prehistoric	2000 (Larry Bourdeau, Pacific Museum Consultants)	Unknown	Outside
P-44-000590	—	101 Quail Hollow Road; Other - Zayante Fire Protection Division Station/ Building	Historic	2005 (Christopher McMorris/Julia Cheney, JRP Historical Consulting)	6Z	Outside
P-44-000769	—	Felton Fire District Station/ Building	Historic	2013 (Dana Supernowicz, Historic Resource Associates)	6Y	Outside
P-44-000855	—	Cowell Home Ranch District/ District	Historic	2006 (David G. Eselius, Historic Opportunities of Santa Cruz)	Unknown	Outside
P-44-000971	—	Southern Pacific Depot/Building	Historic	1988 (Edna F. Kimbro, Historical Architectural Research); 2001 (Brett Rushing, ENTRIX Inc.)	5S2	Outside
P-44-001004	—	Moose Club Lodge/Building	Historic	1995 (Susan Lehmann, SCR County)	7N	Outside
P-44-001014	—	Rose Acres Ranch/Building	Historic	1995 (Susan Lehmann, SCR County)	7N	Outside
P-44-001017	—	Asst. Superintendent's House, Calif. Powder Works; Other - Paradise Park Clubhouse/ Building	Historic	1995 (Susan Lehmann)	7N	Outside

Table 4. Previously Recorded Cultural Resources Within the Records Search Area

Primary Number	Trinomial	Resource Name/ Description	Age	Year (Recorded By)	NRHP/CRHR Eligibility Status	Proximity to APE
P-44-001117	—	6338 Highway 9/ Building	Historic	1986 (Gregory King, Caltrans District 4)	6	Outside
P-44-001118	—	Lazy Daze Motel; Other - Ana-Don Motel/Building	Historic	1986 (Gregory King, Caltrans District 4)	6	Outside
P-44-001119	—	Beach Street/ Building	Historic	1986 (Gregory King, Caltrans District 4)	6	Outside
P-44-001120	—	Bea's Beauty Salon/Building	Historic	1986 (Gregory King, Caltrans District 4)	6	Outside
P-44-001121	—	9420-24 Highway 9/ Building	Historic	1986 (Gregory King, Caltrans District 4)	6	Outside
P-44-001122	—	6407 Highway 9/ Building	Historic	1986 (Gregory King, Caltrans District 4)	6	Outside
P-44-001123	—	6385 Highway 9/ Building	Historic	1986 (Gregory King, Caltrans District 4)	6	Outside
P-44-001124	—	Giblin's Chevron Service/ Building	Historic	1986 (Gregory King, Caltrans District 4)	6	Outside

Status Codes: (1S) Individual Property listed in the NRHP by the Keeper; (5S2) Individual property that is eligible for local listing or designation; (6) Not eligible for listing; (6Y) Determined ineligible for NRHP by consensus through Section 106 process – Not evaluated for CRHR or Local Listing; (6Z) Found ineligible for NRHP, CRHR, or Local designation through survey evaluation; and (7N) Needs to be reevaluated.
Notes: FWARG = Far Western Anthropological Research Group Inc.; JRP = JRP Historical Consulting LLC; Caltrans = California Department of Transportation.

2.2 Additional Research on Built Environment Resources in the APE

In addition to the resources that were identified in the results of the CHRIS search, several other built environment resources were identified in the proximity of the APE that were not returned as part of the CHRIS search. The resources listed below were identified through a review of the California Department of Transportation (Caltrans) Bridge Inventory and documentation provided by the City. A summary of these resources is presented below. Records related to these resources are included in Appendix D, Confidential Record Search Results.

Newell Creek Bridge (36C0041)

The Newell Creek Bridge (36C0141) is located on Glen Arbor Road just south of the intersection with Newell Creek Road within the Project APE. The local agency bridge was completed in 1936 and is included in the Caltrans Historic Bridge Survey with a NRHP historical significance status designation of 5, Ineligible for National Register listing.

San Lorenzo River Bridge (36C0085)

The San Lorenzo River Bridge (36C0085) is located east of the intersection of Highway 9 and Clearview Place and it briefly transects the APE north of Felton. The local agency bridge was completed in 1920 and is included in the Caltrans Historic Bridge Survey with a NRHP historical significance status designation of 2, Eligible for National Register listing.

Bean Creek Bridge (36C0141)

The Bean Creek Bridge (36C0141) is located on Graham Hill Road just south of the intersection with East Zayante Road within the Project APE. The local agency bridge was completed in 1936 and is included in the Caltrans Historic Bridge Survey with a NRHP historical significance status designation of 5, Ineligible for National Register listing.

Graham Hill Water Treatment Plant

The GHWTP is located at the southernmost point of the APE where the NCP pipeline terminates. The GHWTP was completed in 1959 and was evaluated for historic significance by Carey & Co. in 2018 as part of the City of Santa Cruz, Graham Hill Water Treatment Plant, Concrete Tanks Replacement Project. The evaluation concluded that the property does not appear eligible for listing in either the NRHP or CRHR.

Three resources listed above have been previously evaluated and found ineligible as historic properties/historical resources, the Newell Creek Bridge (36C0041), the Bean Creek Bridge (36C0141), and the GHWTP, resulting in no potential for adverse effect/impacts to built environment historic properties/historical resources. The San Lorenzo River Bridge (36C0085) has been previously determined eligible for NRHP but the Proposed Project does not include any actions related to the bridge. It will be left in place and is not part of any Proposed Project related construction or implementation activities. As such there is no potential for the bridge to be effected/impacted by the Proposed Project. Additionally, proposed alterations to the NCP will not directly or indirectly result in any adverse effects to the bridge. As there is no possibility that the San Lorenzo River Bridge (36C0085) will be effected/impacted by the proposed undertaking, it is not included in the APE. For this reason, these historic properties/historical resources are not addressed further within this study.

2.3 Building Development and Archival Research

Dudek conducted additional background research to arrive at a general understanding of the settlement and development of the Proposed Project area. Below is a summary of research efforts.

Santa Cruz Public Library

Dudek staff viewed digital source material related to the development of water infrastructure in Santa Cruz County. The materials reviewed during this visit were used in the preparation of Section 3: Historic Context and Section 4: Significance Evaluation of this report.

Santa Cruz Water Department Archives

City staff provided Dudek with a selection of materials related to the general development of water infrastructure in Santa Cruz County and the development of the NCP. These materials were incorporated throughout this report

and used in the preparation of Section 3: Historic Development of the APE and Section 4: Significance Evaluation of this report.

Historical Newspaper Review

Dudek reviewed historical newspapers from Santa Cruz covering the development of the project area. These documents were used in the preparation of Section 3: Historic Development of the APE and Section 4: Significance Evaluation of this report.

Historical Sanborn Map Review

A review of historical Sanborn Map Company fire insurance maps covering the City of Santa Cruz was conducted as part of the archival research effort for the Proposed Project from the following years: 1888, 1892, 1905, 1928, and 1928–1950*.

Historical Aerial Photographs

A review of historical aerial photographs was conducted as part of the archival research effort for the Proposed Project from the following years: 1931, 1940, 1948, 1953, 1968, 1982, 1991, 2005, 2009, 2010, 2012, 2014, and 2016 (NETR 2021; UCSB 2021).

Historical Maps

A review of historical maps was conducted as part of the archival research effort for the Proposed Project from the following years: 1881, 1889, 1902, 1961, 1969, 1975, 1980, 1986, 1995, 2002, 2012, 2015, 2018 (Wright 1881; Hatch 1889; NETR 2021; USGS 1902, 1955, 1968, 1980, 1991).

2.4 Historic Advocacy Outreach

On April 16, 2021, Dudek, Architectural Historian, Fallin Steffen, sent electronic contact letters to the Santa Cruz Museum of Art and History, the Santa Cruz Museum of Natural History, the University of California, Santa Cruz Special Collections at McHenry Library, and the San Lorenzo Valley Museum. The letters briefly described the Proposed Project and requested information about cultural resources near the Project area.

Felicia Van Stolk from the Santa Cruz Museum of Natural History responded on April 22, 2021 that their collections do not contain any records relevant to the possible presence of cultural or historical resources that might be impacted by the proposed project.

Luisa Haddad of the University of California, Santa Cruz Special Collections at McHenry Library responded on April 22, 2021 thanking Dudek for their outreach and providing information related to cultural resources for the University of California, Santa Cruz campus.

Copies of the historic advocacy outreach submitted in conjunction with this project and all responses are located in Appendix E.

2.5 Field Survey

2.5.1 Methods

Dudek Architectural Historian Fallin Steffen, MPS, conducted an intensive pedestrian survey of the APE on December 2 and 9, 2020. The survey entailed walking all portions of the existing pipeline route and documenting buildings and features with notes and photographs, specifically noting character-defining features, spatial relationships, and observed alterations, and examining any historic landscape features along the route. Dudek documented the fieldwork using field notes, digital photography, close-scale field maps, and aerial photographs. Photographs of the subject buildings were taken with a digital camera. All field notes, photographs, and records related to the current study are on file at Dudek's office in Santa Cruz, California.

The first of two pedestrian surveys of the APE on December 2, 2020, was conducted with an escort from the City, Doug Valby, and followed the San Lorenzo Way Section, the Brackney South Section, the Brackney North Section, and the Newell Creek Road Section. All portions represent parts of the existing pipeline alignment slated to be replaced in their current location. The only cultural resource encountered during the December 2 survey was a portion of the former Felton and Pescadero Railroad, of which Brackney and Glen Arbor were former stops. This railroad alignment is within in the Brackney North, Brackney South, and San Lorenzo Way Sections, and has already been impacted/re-purposed by the original NCP installation.

The second of two pedestrian surveys of the APE on December 9, 2020, was conducted with an escort from the City, Doug Valby, and followed along the Pipeline Road Section which passes through Henry Cowell State Park. This section contains an existing alignment of the pipeline that is proposed to be re-routed along Graham Hill Road.

On December 16, 2020, Archeologists Sarah Brewer, BA, and Julie Royer, MA, conducted a survey focused on the public portion of the Graham Hill Road Section.

2.5.2 Results

During the pedestrian surveys, Dudek identified and recorded the NCP and a section of the former Felton and Pescadero Railroad that has already been re-purposed by the original pipeline installation. Additionally, Dudek recorded the Newell Creek Access Road Bridge and the San Lorenzo River Bridge (36C0085). The significance evaluation (Section 4) provides a detailed physical description of the NCP and a historical significance evaluation under all applicable criteria for potential eligibility. A full DPR 523 form set for the NCP is provided in Appendix F.

3 Historical Development of the APE

The following historic context addresses relevant themes concerning the development of the Project APE, beginning with a discussion of the initial formation and growth of the County, followed by a comprehensive overview of the water-related infrastructure development in the San Lorenzo Valley and the City of Santa Cruz. The section concludes with a discussion of the historical development of the NCP.

3.1 Historical Overview of Santa Cruz County

3.1.1 Spanish Period (1769–1822)

The earliest known European exploration of the Monterey Bay was a Spanish envoy mission led by Sebastián Vizcaíno in 1602. The purpose of the voyage was to survey the California coastline to locate feasible ports for shipping, and Vizcaíno had explicit instructions prohibiting the creation of settlements and interacting with local Native Americans. Finding the bay to be commodious, fertile, and extremely favorable for anchorage during eastward voyages from Manila to Acapulco, Vizcaíno named the Bay "Monterey" after the Conde de Monterey, the present Viceroy in Mexico (Chapman 1920: 293-4; Hoover et al. 2002: 225-6).

Despite being mapped as an advantageous berth for Spanish shipping efforts, the epicenter of Spanish settlement in Alta California did not make its way to the Monterey Bay until the second half of the eighteenth century. In an effort to prevent the establishment of English and Russian colonies in northern Alta California, Don Gaspar de Portolá, the Governor of Baja, embarked on a voyage in 1769 to establish military and religious control over the area. This overland expedition by Portolá marks the beginning of California's Historic period, occurring just after King Carlos III of Spain installed the Franciscan Order to direct religious colonization in assigned territories of the Americas. With a band of 64 soldiers, missionaries, Baja (lower) California Native Americans, and Mexican civilians, Portolá established the Presidio of San Diego, a fortified military outpost, as the first Spanish settlement in Alta California. In July of 1769, Padre-Presidente Franciscan Fr. Junípero Serra founded Mission San Diego de Alcalá at Presidio Hill, the first of the 21 missions that would be established in Alta California by the Spanish and the Franciscan Order between 1769 and 1823, including Mission Santa Cruz in 1791 (Hoover et al. 2002: 226; Lehmann 2000: 3; Koch 1973: 3).

On their quest to locate the Monterey Bay from the 160-year-old accounts of Sebastián Vizcaíno, the Portolá expedition first reached the present-day territory of Santa Cruz on October 17, 1769. After mistakenly circumventing the Monterey Bay and reaching the San Francisco Bay, the expedition backtracked to San Diego. The following year on May 31, 1770, a second expedition was organized by Portolá resulting in a successful location of the Monterey Bay. However, it would be an additional 21 years before the Franciscan order would establish Mission Santa Cruz in the area near the San Lorenzo River (Koch 1973: 2–3; Hoover et al. 2002: 447-8).

Father Fermín Lasuén, Corporal Luis Peralta, and five soldiers established Mission Santa Cruz on August 28, 1791, as the twelfth mission in the California Mission system. The Spanish Padres converted local Native Americans to Catholicism largely against their will, after which they were known as neophytes. Neophytes were forced to build the mission church and auxiliary structures from local timber, limestone, and adobe, as well as to cultivate wheat, barley, beans, corn, and lentils for their captors. In 1792, neophytes were directed to excavate a ditch for the purposes of carrying water from Tres Ojos de Agua (Three Eyes of Water), a group of three creeks near the modern entrance to the University of California, Santa Cruz campus, down to the Mission site. This ditch and the footpath beside it established

the foundation for the future orientation of High Street in the City of Santa Cruz today, and offered the Mission a distinct advantage in a geographic area that often experienced water shortages during the summer months (Hoover et al. 2005: 448; Lehmann 2000: 3-4; SCWD n.d: 1).

From the start, Mission Santa Cruz was plagued by substantial issues. The forced conversion of the local native population by the Spanish Padres resulted in repeated rebellions, violence, desertion, and pestilence at Mission Santa Cruz. In 1793, the neophyte population attacked the Mission guards and burned their station to the ground. In 1798, Padre Fernandez reported that 189 of the approximately 230 neophytes living on the Mission grounds had abandoned the Mission, causing the crops to fail and the livestock to be largely neglected. The Mission also experienced problems wrought by a nearby settlement known as Villa de Branciforte (Lehmann 2000: 3-4).

In 1795, Spain established three self-governing Pueblos in Alta California that, unlike the Missions, would remain free from military and religious oversight. Villa de Branciforte was established in 1797 on the opposite bank of the San Lorenzo River from Mission Santa Cruz along the present-day alignment of both Branciforte Avenue and Branciforte Creek. The 40 settlers of Villa de Branciforte were not provided with the resources promised to build housing or cultivate the land and had to make do with crude dwellings of their own design. In 1803, there were 107 inhabitants, but because the population was made up of former soldiers, artisans, and criminals, they lacked the pertinent skill to farm and sustain themselves. Despite population growth in the initial years, the settlement was quickly deemed a failure by Spain (Lehmann 2000: 4-5).

By 1817, the population of Villa de Branciforte had dwindled to 52 people. In 1818, fearing the attack of the French pirate Hippolyte de Bouchard who had recently attacked the Monterey Presidio, the Mission Padres fled from the Mission Santa Cruz and placed the care of the complex with the remaining inhabitants of Villa de Branciforte. Instead of securing the Mission, the inhabitants of the Villa looted the valuable items from the complex while the Padres were away, including furniture, doors, and flatware. Additionally, just under half of the 410 neophytes living at the Mission fled from the complex during the looting chaos and never returned (Lehmann 2000: 4-5).

3.1.2 Mexican Period (1822–1848)

After more than a decade of intermittent rebellion and warfare, New Spain (Mexico and the California territory) won independence from Spain in 1821. In 1822, the Mexican legislative body in California ended isolationist policies designed to protect the Spanish monopoly on trade, and decreed California ports open to foreign merchants. In addition to eliminating the system of Spanish nobility in California, the Spanish missions across the territory were secularized during this period (Koch 1973: 10; Lehmann 2000: 4).

The secularization of the Spanish Missions meant that all communal mission property was placed in a trust with the intention of being returned to the local Native American population. In Santa Cruz, the land stolen by the Spanish was returned to Native Americans between 1834 and 1839, but a smallpox epidemic in 1838 and reoccurring bouts of syphilis caused a massive decline in the Native American population from 284 persons in 1837 to only 71 persons in 1839. This meant that very few eligible Native American recipients remained to receive it, and records indicate that overall, only 25 Native Americans held property in the Santa Cruz area between 1834 and 1849 (Lehmann 2000: 4-5).

Extensive land grants were established in the interior during the Mexican Period, in part to increase the population inland from the more settled coastal areas where the Spanish had first concentrated its colonization efforts. Land grants to citizens covered over 150,000 acres of present-day Santa Cruz County. Three land grants

covered the regions of the densely forested Santa Cruz Mountains that falls within Santa Cruz County, including *Rancho Zayante* (1841), *Rancho Cañada del Rincon en el Rio de San Lorenzo* (1843) and *Rancho Carbonera* (1838) (Hoover et al. 2002: 455-457; Robinson 2012: 7).

The scarcity of water in the future City of Santa Cruz intensified towards the end of the Mexican Period with assistance from a formal decree by the Santa Cruz Alcalde, Don Manuel Rodriguez. In 1844, Rodriguez transferred the rights to the water carried by the 1792 aqueduct to the limited control of the mission and eight adjacent grant-holders. After this point, the growing population in the outlying areas of Santa Cruz became exclusively reliant on water taken from shallow wells and surface sources that were subject to seasonal surge and drought cycles, such as the San Lorenzo River (SCWD n.d.: 1).

3.1.3 American Period (1848–Present)

The Mexican American War ended with the Treaty of Guadalupe Hidalgo in 1848, ushering California into its American Period. Santa Cruz was designated as one of the 27 original counties of California on February 18, 1850, shortly before California officially became a state with the Compromise of 1850. The new State of California recognized the ownership of lands in the state distributed under the Mexican land grants of the previous several decades (Lehmann 2000: 5; Koch 1973: 35).

As the Gold Rush was picking up steam in 1849, a massive influx of people seeking gold steadily flooded the rural counties of California. The gold fields quickly dried up, causing many new arrivals to refocus on other economic opportunities. In Santa Cruz County, insightful entrepreneurs saw the arrival of opportunity-seeking laborers as a means to harvest the abundant natural resources found throughout the area. In the northern areas of the young county, the lumber, mining, fishing, tanning, and leisure industries formed the economic foundation of the County. In the central and southern areas of the County, early settlers took advantage of the fertile soil and temperate climate to establish large farms and dairies. Agricultural products including grain and apples were among the County's earliest and most successful (Lehmann 2000: 7).

As the County moved into the 1900s, agriculture and tourism continued as the region's most prominent economic drivers. By the late 1950s, the population began to expand with aid from the establishment of Cabrillo College in 1959 and the University of California at Santa Cruz in the 1965. These higher education facilities brought both students and jobs as the schools became major sources of community employment throughout the County. During the 1980s, a number of technology companies settled in the area due to its proximity to Silicon Valley. Today, tourism, agriculture, manufacturing, and technology are the key industries that provide the economic base for County's 273,213 residents (U.S. Census Bureau 2019).

3.1.3.1 Development of Early Transportation Corridors in Santa Cruz County

The earliest railroad in the County was built and operated by the Southern Pacific Railroad (SPRR) in 1871, which was situated at the southern-most point of the County connecting the City of Watsonville with the City of Gilroy. In 1873, Fredrick A. Hihn and Claus Spreckels filed incorporation papers for the Santa Cruz Railroad, a narrow-gauge railroad line connecting the City of Watsonville to the City of Santa Cruz. The line, known as the Santa Cruz- Watsonville Railroad, was completed in 1876 and later purchased by a SPRR subsidiary in 1881 (Clark 2008: 309, 331).

As the number of lumber operations in the County grew rapidly, transportation infrastructure developed simultaneously to support the movement of goods from remote processing locations in the Santa Cruz Mountains.

The earliest efforts to transport lumber and lime resulted in the construction of roads like as Graham Hill Road, or "Graham's Grade" as its was first known, which was completed by Isaac Graham in the 1840s leading from the upper reaches of the San Lorenzo Valley to the Santa Cruz Wharf. Graham was an American who arrived in California sometime during the 1830s, and after a brief imprisonment in Tepic, Baja California, he settled on Rancho Zayante in 1841 where he set up enterprises in lumbering, cattle ranching, leather tanning, and distilling. Although the road has been somewhat realigned, it has remained in continual use since its completion in the 1840s (Clark 2008: 130; Robinson 2012: 8).

Navigating the steep, angled roads through the valley while driving heavy, lumber-filled wagons was a dangerous undertaking even for experienced teamsters, but the unpredictability of seasonal weather changes often proved deadly. The unreliability of transporting lumber by wagon prompted the development of a flume along the San Lorenzo River to easily move the lumber to port instead. While the initial plan called for the flume to stretch over 20 miles from the mountains to the coast, seasonal drought of the lower San Lorenzo River and tributary creeks encouraged the need instead for a narrow-gauge railroad to begin at the flume terminus in Felton leading down to the harbor. Work on the Felton Lumber Flume and the Santa Cruz and Felton Railroad (Exhibit 1) was completed simultaneously during 1875. The terminus of the 9-mile flume and the new rail line was in Felton, California, where the lumber originating as far as 2 miles north of Boulder Creek, floated down the water-driven flume and could be loaded onto the train and hauled safely downhill to shore. Overall, the water-powered gravity flume drastically increased the availability of Santa Cruz lumber to a wider market, while the rail line opened the San Lorenzo Valley up to tourism (Hoover et al. 2002: 462; Robinson 2012: 20).



Exhibit 1. An early photograph of the Felton Flume (center) alongside the narrow gauge Santa Cruz and Felton Railroad (engine and tracks at right) (University of California, Santa Cruz Special Collections).

In 1876, construction of the South Pacific Coast Railroad began between Alameda and Santa Cruz via San José. When it was completed in 1880, the narrow-gauge railroad traveled southwest from Los Gatos into the densely forested areas on the Santa Clara side of the Santa Cruz Mountains before emerging into Santa Cruz County through a 6,200-foot tunnel at the summit. The line wound down through the small communities of Laurel, Glenwood, Clems, Doughertys, Zayante,

and Felton before continuing along the tracks leased from Santa Cruz and Felton Railroad through Big Trees, Rincon, and the Powder Works before reaching the terminus in Santa Cruz (Clark 2008: 332).

In 1883, articles of incorporation were filed for the Felton and Pescadero Railroad company, which was intended to connect the town of Felton with the coastal town of Pescadero located in San Mateo County. The announcement of the newly formed company included a reference to the abundant virgin redwood forests of Big Basin that would be made accessible by the new railroad, claiming "the millions of lumber they will produce is beyond reasonable computation" (Santa Cruz Surf 1883: 3)." Bids for the first 7.5 miles of tracks between Felton and Boulder Creek including the "grading and bridging … of roadbed, also for the laying and surfacing of the track" (Santa Cruz Surf 1884: 1) were requested during the summer of 1884 and completed in 1885. The Felton and Pescadero line was almost immediately incorporated into the South Pacific Coast Railroad, and this section constitutes the only part of the Felton and Pescadero railroad that was ever completed. Small communities emerged along this new route including Brackney, Glen Arbor, Ben Lomond, and Brookdale (Santa Cruz Surf 1883: 3, 1884: 1; Clark 2008: 332).

In 1887, the Santa Cruz and Felton Railroad, the South Pacific Coast Railroad, and the Felton Pescadero Railroad incorporated together with several other small subsidiaries into the South Pacific Coast Railway Company, which was then leased to the SPRR. The SPRR converted the original narrow-gauge tracks to broad-gauge beginning in 1905 (Exhibit 2), but the project was spectacularly delayed after the earthquake of 1906 caused widespread damage. It took nearly 3 years before the tracks were adequately repaired and the first broad-gauge train passed from Los Gatos to Santa Cruz in 1909. In 1934, the 7.5-mile section originally built as the Felton and Pescadero Railroad was decommissioned, and the tracks were pulled up. The remainder of the consolidated South Pacific Coast Railway Company was purchased outright by SPRR in 1937 and regular rail service along the line ceased in 1940 (Clark 2008: 111, 332; SC Evening News 1936a: 7).



Exhibit 2. A photograph showing the expansion of either the Santa Cruz and Felton Railroad or the Felton and Pescadero railroad from narrow to broad-gauge in the proximity of Felton, c. 1905 (University of California, Santa Cruz Special Collections).

3.1.3.2 Tourism Industry in Santa Cruz County

Interest in the beauty of the Monterey Bay drew visitors to the County beginning in the 1860s, causing beach tourism to emerge early on as another major industry in the County. Tourism was also responsible for quickening the rate of development along the scenic coastal areas of Santa Cruz County. The completion of railroads in the County, including the Santa Cruz and Felton Railroad in 1875, the Santa Cruz–Watsonville Railroad in 1876, and the South Pacific Coast Railroad in 1880, provided greater mobility into and throughout the County from the Bay Area and inland areas of the state by both residents and tourists alike. As the rise of trains also reconfigured shipping from the Santa Cruz wharf to the new railroads, shipping from the wharf altogether declined due to lack of use and the ease of transport by train, the beachfront areas of the City presented savvy entrepreneurs with new emerging opportunities (Lehmann 2000: 14, 25-6).

By 1893, Harper's Weekly acknowledged the County as a beach destination, promoting beachside institutions like the Neptune Baths built in 1884 by Captain C.F. Miller, and giving the coastal destinations, including Fredrick A. Hihn's Camp Capitola, the push needed to become national tourist destinations. The economic transition away from the early industries of the County towards tourism during this period helped to alleviate the strain placed on the forests in the north of the County, which had experienced widespread deforestation as a result of early logging and lime production activities in that area. By the close of the nineteenth century, few old-growth redwood specimens remained in the forests of the Santa Cruz Mountains, and as it became increasingly clear that these trees were

capable of drawing crowds on their own, their conservation became a dual effort to both save the trees and simultaneously promote Santa Cruz County as a one-stop tourism destination. With the help of the railroads, a tourist to the County could visit the seaside attractions as well as the groves of *Sequoia Sempervirens*, or coastal redwoods, within a single day. While the coastal redwood occupied several areas within the County, a grove located south of Felton alongside the San Lorenzo River known as Felton Big Trees, or Big Trees, and two distinct Big Trees resorts were developed within this area during the late nineteenth century, which were formally separated only by a fence. The Santa Cruz and Felton Railroad line included Big Trees stop, which allowed for ease of access to the otherwise remote locations of these parks (Exhibit 3) (Lehmann 2000: 14).



Exhibit 3. A postcard showing the Big Trees railroad stop along the Santa Cruz and Felton Railroad south of Felton, c. 1920s (University of California, Santa Cruz Special Collections).

The earliest Big Tree resort was established by Joseph Warren Welch on his 350-acre property sometime after 1867. Welch's Big Tree Grove contained conveniences including a lodging house, a saloon, a store, and an outdoor event venue. In 1930, the Welch family sold the property to the County for the creation of a local park, which became known as Santa Cruz County Big Trees Park (Clark 2008: 28).

The second resort was established in 1895 to the south of Welch's resort on property that was owned by the Cowell family. Cowells Big Tree park included guest cabins, a coffeeshop, and a souvenir shop. The park was leased to the Hopkins family in later years before it was finally closed to the public in 1942. In 1954, as a memorial following the death of his father, Samuel H. Cowell donated 1,623-acres of land including the Cowells Big Trees property to the State of California. During the same year, the donation to the State was combined with the former Welch's Big Tree Grove property comprising the Santa Cruz County Big Trees Park to form, the Henry Cowell Redwoods State Park. The new park named after Samuel Cowell's late father, Henry Cowell (Clark 2008: 28).

In 1963, as interest in the now non-operational railroads in the Santa Cruz Mountains grew, Norman Clark established a private amusement park known as Roaring Camp & Big Trees Narrow Gauge Railroad alongside the Henry Cowell Redwood State Park, where it was advertised that "1860s steam locomotives climb the western U.S.'s steepest railroad grades through groves of giant redwoods" (Clark 2008: 282). In 1985, Clark purchased the tracks and ROW for the SPRR between Santa Cruz to Olympia (composed of the former Santa Cruz and Felton Railroad path and a portion of the South Pacific Coast Railroad path) and formed the Big Trees and Pacific Railway Company to provide rail tours between Felton and Santa Cruz (Clark 2008: 282, 331).

3.2 Water Management in North Santa Cruz County

3.2.1 Early Water Management in Santa Cruz County

Several miles north of the evolving city center at the base of the Santa Cruz Mountains, multiple mountain streams and tributaries carve deep channels and valleys through the dense redwood and oak timberlands. The extensive virgin forests and the rich underground deposits of lime in the Santa Cruz Mountains attracted opportunistic settlers and purveyors in the mid- to late-1800s who sought to harness the power of the mountain streams to move the goods located in the remote area to market (Hoover et al. 2002: 456).

The California Gold Rush of 1848 accelerated the desirability of land across the state, and before long, access to water in the drought-prone region took on the highest level of importance. Instead of adopting an equal water access structure in the fashion of the eastern United States, the wealth potential of waterways during the Gold Rush shaped California water law into a "first in time, first in right" system known as Prior Appropriation. Under this system, riparian rights were granted to the first person to use a river or tributary for beneficial consumption like mining, farming, milling, or as-needed domestic use. When land in the Santa Cruz Mountains was subdivided and sold, access to the rivers and streams was enormously important. Not only did it mean that the initial use set out for a waterway was the primary use, it also meant that any subsequent uses could not supersede or negatively affect the chief use. The order that claims were recognized during this period established the foundation of the complicated system of water allocation rights still in use today in the County (Pisani 1984: 246–247).

Many of these powerful mountain streams and tributaries were utilized by early landowners and tenant entrepreneurs to make a profit from the natural resources that formed the early economic basis of the County. Several of these mountain creeks still bear the names of the first men who established mills or permanently settled

beside them. Majors Creek was named for Joseph L. Majors who established a grist mill on the creek prior to serving as the County Treasurer between 1850 and 1853. Liddell Creek was named for George Liddell who moved to the Santa Cruz Mountains and established a sawmill on the creek in 1851. Newell Creek was named for Addison Newell who established a farm in the steep, V-shaped valley on the banks of the creek in 1867 (Koch 1973: 33–34; D. Clark 2008: 174, 187, 215).

For others, the streams presented pure economic opportunity. The first power sawmill in California was built on Rancho Zayante by Isaac Graham in the 1842 and was driven by the waters of Zayante Creek. Isaac E. Davis and Albion P. Jordan of the Davis and Jordan Lime Company purchased a portion of Rancho Cañada del Rincon in 1853 as a promising quarry site. They also utilized the falling water on the property to process local lumber into fuel for their many kilns. The California Powder Works was established in 1865 on the bank of the San Lorenzo River on a portion of Rancho Carbonera. The Powder Works used the river to grind raw materials used in the production of the first smokeless powder manufactured on the west coast of the United States. By 1868, there were a sizable number of business and industries that relied on water from County waterways to operate, including 12 water-powered lumber mills, 10 steam-powered lumber mills, and 9 shingle mills in operation within the County (D. Clark 2008: 130–131; Hoover et al. 2005: 456; Koch 1973: 36–37; Brown 2011: 4).

3.2.2 Water Management in the San Lorenzo Valley

By the late 1800s and early 1900s several small communities were scattered throughout the San Lorenzo Valley. These areas developed as a result of mining and lumber operations, the arrival of multiple railroads into the remote areas of the valley, and the increased popularity as a tourist destination for development of vacation homes. The remote nature of these small subdivisions caused them to rely on small, self-contained water systems. The communities of Ben Lomond, Brookdale, and Boulder Creek for example, formed their own, distinct water systems designed to serve the needs of residents who occupied their vacation homes only a few weeks a year which were supplied by nearby springs and creeks by way of flumes or pipelines. When the County population doubled between 1900 to 1940 from 21,512 to 45,057 persons and more people moved permanently into the valley, the existing water systems became inadequate (SLVWD 2020; SCPL n.d.: 1).

Frequent droughts between 1912 and 1939 convinced San Lorenzo Valley leaders to form a water district to better control water, to serve the needs of the valley. After one failed attempt to form a county water district by election in 1939, the San Lorenzo Valley Water Department (SLVWD) was formed by the voters on April 3, 1941. Negative voter returns from the towns of Felton and Scotts Valley left those areas out of the district boundaries, which included Bear Creek, Boulder Creek, Alba, and Ben Lomond school districts, and part of the Sequoia school district (SLVWD 2020).

By the late 1950s, population growth and new development throughout the Valley had exacerbated an already tenuous water situation within the SLVWD. In 1959, the SLVWD signed an agreement with the City of Santa Cruz, in which the district sold the City its timber and mineral rights to the Newell Creek watershed, in exchange for one-eighth of the water rights from the water stored by Newell Creek Dam following its development in 1960. The development of the Newell Creek Dam and the Newell Creek Pipeline is discussed in detail in Section 3.3 below (SLVWD 2020).

Today, the SLVWD supports a population of approximately 35,000 people across roughly 60 square miles of service area encompassing the towns and communities of Ben Lomond, Boulder Creek, Brookdale, Felton, Lompico, and Zayante. The system also includes sections of the City of Scotts Valley, including two subdivisions (the Pasatiempo Pines and Manana Woods) and two mobile home parks (Vista del Lago and Spring Lakes) (SLVWD 2020; SVWD 2020).

3.2.3 Water Management in the City of Santa Cruz

As water management techniques were being applied to a variety of industries throughout the County, the successful technologies developed and used in early natural resource harvesting such as flumes and pumps prompted local residents in the City of Santa Cruz to consider why these were not being put to use for the benefit of drinking water. The following section provides an outline of specific projects and miles stones related to the development of water management systems in the City of Santa Cruz.

3.2.3.1 Private Development (1864–1916)

Beginning in the 1860s, acute cyclical water shortages and pollution prompted the development of several for-profit water systems in Santa Cruz. By the end of the 1880s, the two surviving major water companies, F.A. Hihn Water Works and the Santa Cruz Water Company, were joined into a single private business that competed with the new municipal water system that began in 1890 for almost three decades before being purchased by the City and integrated into the municipal system in 1916.

3.2.3.1.1 F.A. Hihn Water Works (1864)

In 1864, prompted by the issue of shortage, young entrepreneurs Elihu Anthony and Fredrick A. Hihn implored the Board of County Supervisors to allow them to dig trenches and lay redwood pipes to transport water throughout Santa Cruz. The "wooden tubes" were chosen as an inexpensive alternative to iron pipes (Santa Cruz Weekly Sentinel 1864: 2). The source of the water was an 8,000-gallon reservoir on Anthony's property supplied by water from Scott's Creek, and eager recipients of the water could gain access for a fee. (Brown 2011: 1–2; Santa Cruz Weekly Sentinel 1864: 2).

By 1876, the 1864 system was known as the F.A. Hihn Water Works, and it was the largest provider of water in the newly chartered City, with Dodero and Carbonera Creeks constituting its primary sources. The company predated the incorporation of Santa Cruz by 2 years (Koch 1973: 35; Brown and Dunlap 1956: 14; City of Santa Cruz 2020).

3.2.3.1.2 The Santa Cruz Water Company (1866)

In 1866 a new, fee-based, private water supply company was founded to share in the lucrative profits of the F.A. Hihn Water Works. A man named E. Morgan acquired rights to the waters of the San Lorenzo River in 1866, just prior to the town of Santa Cruz being officially incorporated later that year. He used these rights to install a section of pipework conveying water to the area known then as the "The Flats," which comprises the modern area of Pacific Avenue and Front Street (SCWD n.d.: 1).

In 1876, Morgan sold his system to a wealthy man from San Francisco named H.K. Lowe. Under Lowe's guidance, the Santa Cruz Water Company incorporated in July 1876 and began construction on a pumping station on the San Lorenzo River approximately 1 mile upstream from the City, as well as a new reservoir located on High Street. Morgan retained 50 company shares and became the resident engineer and superintendent of the Santa Cruz Water Company. By the end of 1876, the company had also installed a Branciforte Creek diversion to deliver water via a pipeline to a new reservoir located at the base of School Street. As the City continued to grow and the steam-powered pumping plant installed on the San Lorenzo River became the source of repeated water-quality concerns, the Santa Cruz Water company acquired partial water appropriation rights to the Majors (then called Cojo Creek) in

1881. After the acquisition, the company scrapped the whole San Lorenzo pumping plant for $800 (Santa Cruz Weekly Sentinel 1877a: 1; 1877b: 2; SCWD n.d.: 1).

For the next several years, the Santa Cruz Water Company focused its attention on the construction of a pipeline to divert water from Majors Creek. This effort was very costly, and the company slipped into dire financial condition. In August 1886, the company along with all of its appurtenances was sold to the City, financed through the sale of bonds from the Bank of Santa Cruz and the Anglo-Californian Bank. Hihn bitterly opposed the issuance of the bonds and contested their legality in court. The matter reached the Supreme Court and the election in favor of the bonds was declared invalid in 1887. By this time however, the City had already operated the water system for over a year when it was re-conveyed to private owners in 1887 (Santa Cruz Weekly Sentinel 1882: 3; SCWD n.d.: 1; Santa Cruz Surf 1890a: 1).

The City voted again in March 1888 to put up the bonds necessary to purchase the Santa Cruz Water Company system from the private owners. However, while the City was in the process of securing the bonds for the purchase, the Santa Cruz Water Company system was covertly sold to F.A. Hihn in a private, backroom transaction before the City could obtain legal ownership. Hihn quickly consolidated the Santa Cruz Water Company system with his own system of works. This transaction effectively severed any opportunity the City had of acquiring an established water works system with which to launch their own public water system (Santa Cruz Daily Surf 1888a: 3, 1888b: 2; Santa Cruz Surf 1890a: 1).

F.A. Hihn continued to operate the consolidated system as the Santa Cruz Water Company and expanded the service area east into the Seabright neighborhood until his death in 1913 (SCWD n.d.: 1).

3.2.3.2 Public Development (1890–1917)

During the 1880s, the rising price of these fee-based water systems like the F.A. Hihn Water Works and the Santa Cruz Water Company prompted the City to explore their own, city-owned, public water option. After several disappointing attempts to acquire an existing system of water works, the City revised its approach and began planning to build a diversion system and storage reservoir from the ground up, prompting the development of the first municipal water project in Santa Cruz, the Laguna Creek Dam and the Cowell Reservoir. This project led the way for other ambitious water system development in the City including several other north coast stream diversions and the first pumping plant on the San Lorenzo River. In 1916, the City acquired the rights to the Santa Cruz Water Company and began to tie in the systems as one, forming the basis of the modern City system used today.

3.2.3.2.1 The Laguna Creek Dam and the Cowell Reservoir (1890)

In July 1888, the Common Council secured the water rights to the Laguna Creek. "The Laguna," the *Santa Cruz Sentinel* reported, "is a rushing, roaring mountain stream, entirely rock bound and tree shaded above the falls where it is proposed to take the water out (Santa Cruz Sentinel 1888: 2)." The stream was capable of supplying 1.4 million gallons towards a City-owned water works. Plans were finally in motion for the construction of the first city-owned water works, supplied through a new pipeline by the waters of Laguna Creek, with reserve storage in a new City reservoir on Henry Cowell's ranch property known as the Cowell Street Reservoir, which was located roughly at the present site of the U.C. Santa Cruz Arboretum. The *Santa Cruz Surf* reported with excitement that the new project would mean open, municipal water so that each citizen of Santa Cruz could finally "quench his thirst with free water without 'dropping a nickel in the slot'" (Santa Cruz Surf 1890a: 1).

The bonds required to fund the construction of the City water works were secured within the following year, and in July 1889, a civil engineer named G.S. Schussler issues a report in favor of the project that valued the proposed undertaking at $260K (Santa Cruz Surf 1889a: 3, 1889b: 3).

The prominent San Francisco firm Risdon Iron Works was selected as the contractor, who were known for producing the great iron pipes for steam ships. The *Santa Cruz Surf* reported that work on the dam on Laguna Creek and the dam at the reservoir site would be completed by the San Francisco contracting firm Kelso and Dare (Santa Cruz Surf 1889c: 3).

On September 30, 1890, the *Santa Cruz Surf* reported that the reservoir and the pipeline of the City water works were nearly complete. The article published an in-depth description of the new Laguna Creek Dam (Exhibit 4), stating that (Santa Cruz Surf 1890b: 3):

> The dam across Laguna Creek just above the Henneuse place is one of the finest pieces of rubble stone work in the county and not to be excelled anywhere. The granite rocks used in its construction were taken from the bed of the creek, some of them weighing as much as two tons. The water will first be diverted from the Laguna at this point into a flume 3x4 feet and one hundred feet in length, also built of solid masonry. This is nearly level and terminates in a basin two feet lower, and into which the sand and sediment which may be carried in the water in a time of storm will settle. Gates are provided by means of which this basin can be cleared as often as required. From here the water will enter the 14-inch main through which it will be carried to the storage reservoir. This pipe follows the canyon of the Laguna creek as nearly as possible to the county road a distance of about three miles.



Exhibit 4. The earliest known photograph of the Laguna Creek Masonry Dam published in the Santa Cruz Surf in 1892 (Santa Cruz Surf 1892: 2).

On October 18, 1890, the last pipe connecting the Laguna Creek to the new Cowell Street Reservoir (Exhibit 5) was put into position. The pipeline emptied into the reservoir for storage and eventual distribution to the homes and businesses of Santa Cruz (Santa Cruz Surf 1890c: 3).



Exhibit 5. The earliest known photograph of the Cowell Street Reservoir published in the *Santa Cruz Surf* in 1892 (Santa Cruz Surf 1892: 2).

3.2.3.2.2 Reggiardo Creek Diversion (Flume 1891, Dam 1912)

A 965-foot-long flume was completed in 1891 connecting the west branch of Laguna Creek, colloquially known as Reggiardo Creek, to the main Laguna Creek by emptying out water to the north of the Laguna Creek Dam. The new flume was intended to help supplement the municipal supply from Laguna Creek, as the year-old Laguna Creek Dam was quickly inundated with sediment and less water than expected was being captured by the system overall (Santa Cruz Surf 1892: 2).

In 1912, R.S. Tait, the water superintendent, announced that a dam had been completed on Reggiardo Creek to aid in the supply of daily drinking water sourced from Laguna Creek. The level of Laguna Creek had been significantly reduced by a lack of rainfall in the watershed area, causing the supply of water in the impoundment to drop below sufficient levels to support the community (SC Evening News 1912: 2).

3.2.3.2.3 High Street Distribution Reservoir (1904)

In 1894, the City purchased a parcel of land located on the south side of High Street between present-day Laurent and Storey Streets for the construction of a Distribution Reservoir. The Cowell Reservoir was constructed to hold

60 million gallons, but it was carved into a porous limestone formation known as karst that caused approximately 1 million gallons of leakage daily. The Distribution Reservoir was intended to serve are a secondary reservoir for the Cowell Reservoir to preserve the water that was otherwise lost before it could be pumped into the distribution system (Santa Cruz County Assessor 1894; SCMU 2016: 1).

The site for the Distribution Reservoir overlapped Dodero Spring Creek (then called Meyrick Brook) and provided the added benefit of impounding a percentage of the water from this source while temporarily storing the water impounded from the City Water Works on Laguna and Reggiardo Creeks. The survey and specifications for the new reservoir were completed in 1895 and the Santa Cruz Sentinel reported that the reservoir would have a capacity of 2.5 million gallons and cover three-quarters of an acre. Construction on the reservoir began in 1904 and it was completed later that year (Santa Cruz Sentinel 1895: 3, 1903: 4, 1904: 3).

3.2.3.2.4 Liddell Spring Diversion (1913)

Discussions about securing the title to Liddell Spring and utilizing it as a source of municipal water were gathering support in the City government beginning early in 1913. By July 1913, a pipeline between Liddell Spring and the main municipal pipeline from Laguna Creek was operational, and, at a rate of 590,000 gallons per day, was outproducing all the other existing municipal water sources (SC Evening News 1913a: 1).

3.2.3.2.5 Crossing Street Pump Station (1913)

In 1913, a new well was drilled on the San Lorenzo River at Crossing Street, just north of the present intersection of Highway 1 with the river. It was equipped by a 75-horsepower, 5-inch, three-step centrifugal pump that was installed by the United Iron Works. The pump was capable of pumping 500 gallons per minute and cost $1844 dollars at the time of installation (SC Evening News 1913b: 1).

3.2.3.2.6 Acquisition of the Santa Cruz Water Company System (1913–1916)

Fredrick Hihn passed away in 1913 and his ownership of the Santa Cruz Water Company passed to his children. The City seized the opportunity to acquire the Santa Cruz Water Company system, and in 1916 assumed full legal ownership of the entire system, which included right to water being drawn from Branciforte Creek, Carbonera Creek, Majors Creek, and the San Lorenzo River (SCWD n.d.: 2; Monterey American 1913: 7; SC Evening News 1914: 1).

3.2.3.3 Public Development (1918–1939)

Public development during this period was predominantly focused on the repair and upgrade of existing system components. Although upgrades and additions were added to the several major facilities to increase the ability to store and improve the overall quality of municipal water during this period, with projects such as the Bay Street Reservoir in 1924 and the New Crossing Street Pumping Plant in 1929, the output was not widely increased between 1917 and 1930. Service began expanding into the areas to the east outside of the City with focused initiatives like the East Side Water Extension during this period (Brown and Dunlap 1956: 1-2).

3.2.3.3.1 The Bay Street Reservoir (1924)

The Bay Street reservoir was completed in 1924 and was located 1 mile southeast of the Cowell Street Reservoir on a site to the east from the present intersection of Bay Street and Meder Street. The 35-million-gallon capacity

open-air tank was built to replace the Cowell Street reservoir. The Bay Street reservoir was constructed of stone and lined with concrete and was intended to be much more capable of reserving water accumulated from the surface stream sources for use during the dry summer and fall months (Exhibit 6) (SCMU 2016: 1).



Exhibit 6. Construction of the Bay Street Reservoir in 1924 (SCPL 1924).

3.2.3.3.2 Crossing Street Pumping Plant (1929)

In 1929, the City completed a new, modern pumping plant on the Lorenzo River on the southern side of Crossing Street across from the 1913 Crossing Street Pumping Plant site (Exhibit 7). Once complete, the plant went by the same name as its predecessor until it eventually was known simply as the Municipal Pumping Plant. Today, it is called the Coast Pump Station.

The new facility was designed by City engineer Roy Fowler and consisted of a pumping plant capable of producing 6 million gallons of potable water in a 24-hour period from the San Lorenzo River. The plant operated with the help of "diesel engines, pumps, motors, generators, and all other necessary auxiliary equipment" (SC Evening News 1928: 8). The plant also treated the water with chlorine, making it safer to drink (SCWD n.d.: 3; Brown and Dunlap 1956: 1; SC Evening News 1928: 8, 1929: 7).

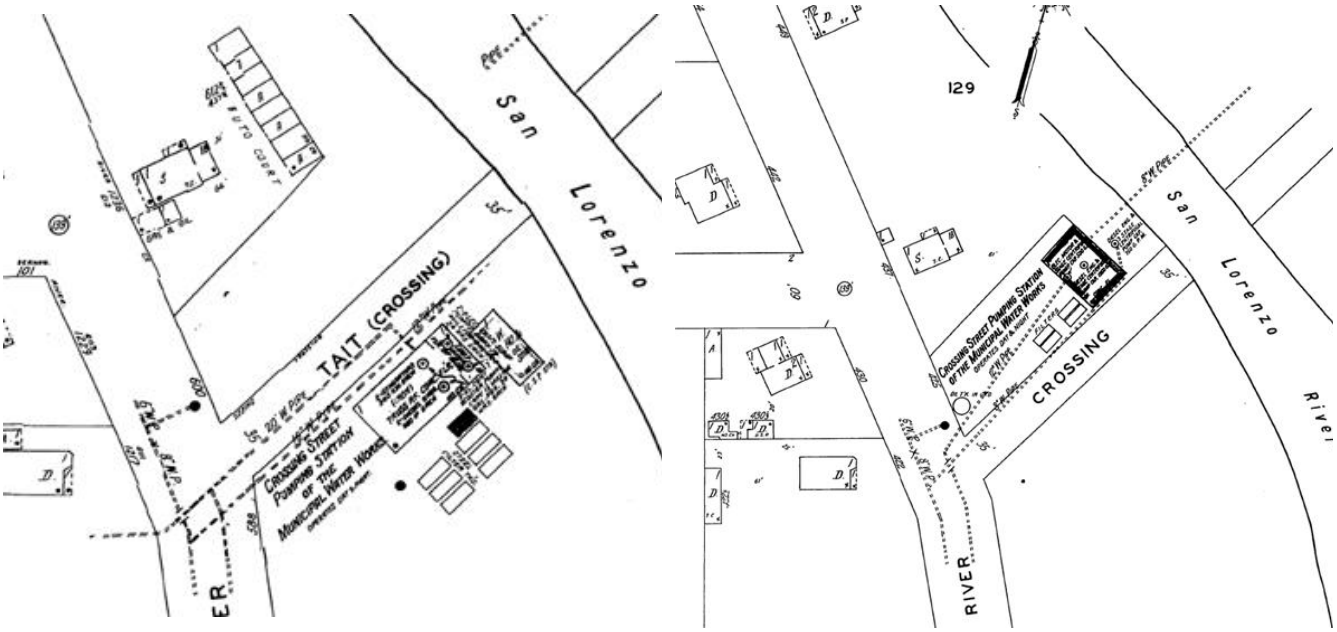
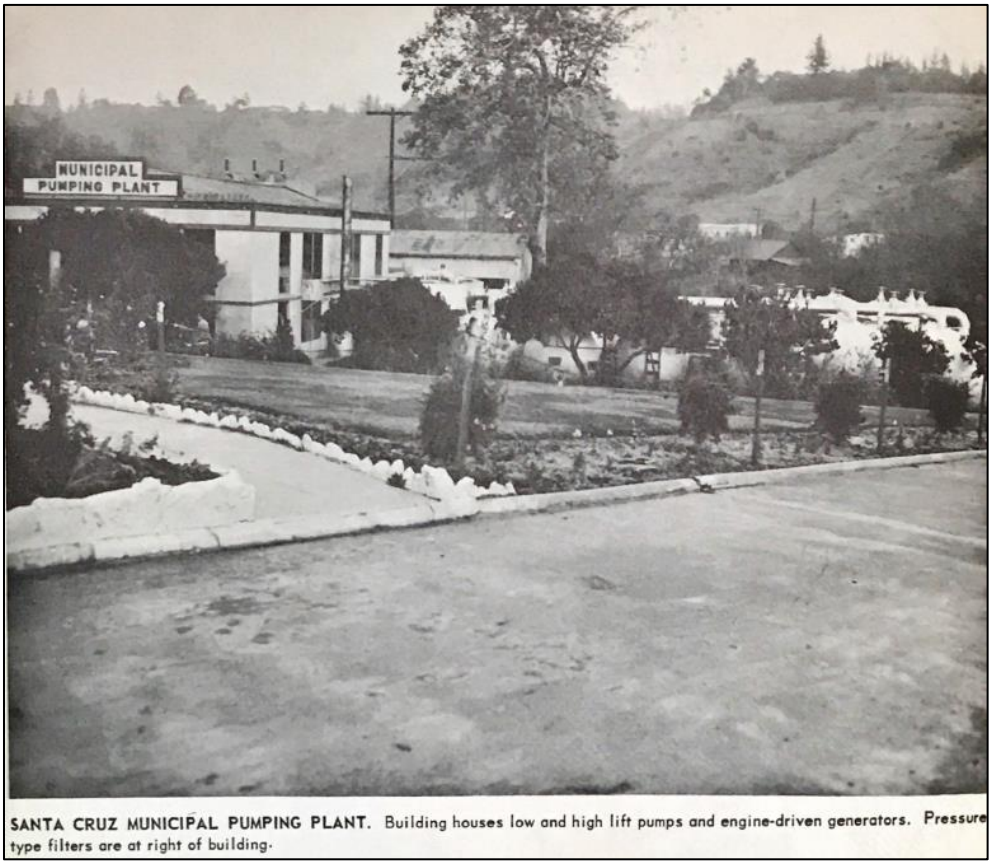


Exhibit 7. Comparison of the 1928 Sanborn Map (left) showing the old Crossing Street Pumping Plant and the 1928-1950 Sanborn Map showing the new facility completed in 1929 in approximately 1945 (right) (Sanborn Map Company 1928: 103, 1928–1950: 103).

The low rainfall in winter 1931 prompted the City to drill four more wells at the site of the Crossing Street Pumping Plant. One of the wells was located at the site of the pumping plant on the west side of the river, while the remaining three were drilled on the east bank. This increased the output of the municipal water supply greatly and allowed for expansion into other parts of the City. In 1934, the City boasted in the *Santa Cruz Sentinel* that 63.4 million gallons of water had earned the City a profit of $11,119 during April 1934 (Brown and Dunlap 1956: 14; SC Evening News 1931: 5; Santa Cruz Sentinel 1934a: 7).

In 1945, Crossing Street was renamed Tait Street for Water Superintendent R.S. Tait. A photograph of the Municipal Pumping Plant included in the 1956 investigative report into the Santa Cruz area water supply projects by engineers Brown and Dunlap demonstrates how the plant appeared during this period (Exhibit 8) (Santa Cruz Sentinel 1945: 8).



SANTA CRUZ MUNICIPAL PUMPING PLANT. Building houses low and high lift pumps and engine-driven generators. Pressure type filters are at right of building.

Exhibit 8. The Municipal Pumping Plant as it appeared in 1956 (Brown and Dunlap 1956: 18).

3.2.3.3.3 East Side City Water Extension (1934)

In 1934, work began on what was known as the East Side Water Extension, to extend the municipal water service into the Seabright and Live Oak areas of Santa Cruz via a new pipeline. Santa Cruz East Side residents C. W. Raisch, E. Brandt, George Ellison, Edith H. Evans, and Nathan Menderson donated the private property to the City needed for a right-of-way, and the pipeline extended from the municipal system to the areas of the City located on the east side of the San Lorenzo River. Additionally, two 1,000,000-gallon tanks were placed in De Laveaga Park in the north of the City as a reservoir for this branch of the system (Santa Cruz Sentinel 1933: 7, 1934b: 9).

3.2.3.4 Private Development (1936–1939)

In areas of the county that were not serviced by the municipal system, private systems such as the Beltz system were developed by residents to provide water for other residents of the area.

3.2.3.4.1 Beltz Water Company (1936)

In 1936, the County granted Iowa native, Charles Lemar Beltz, the rights to begin operating a private water system in the area of the County roughly bounded by Capitola Road to the north, Rodeo Gulch and Corcoran's Lagoon to the west, the bay to the south, and 41st Avenue to the east. The ambitious service area of the Beltz system covered approximately 25% of the Live Oaks district with water sourced from ground wells located throughout the district and conveyed through pipelines situated beside Live Oak roads (Santa Cruz Sentinel 1936: 8, 1947: 1; SC Evening News 1936b: 2).

3.2.3.5 Post-War Water Infrastructure Expansion (1945–1984)

Many of the post-war water projects in Santa Cruz can be characterized as repair of existing infrastructure and expansion of the overall water system to support rapid population growth. The years following World War II provoked westward migration and an increase in birth rates, causing the population of California to increase from 6.95 million to 10.65 million between 1940 and 1950. In Santa Cruz, the growth of the community from 27,430 to 41,680 between 1940 and 1950 caused the common seasonal water shortages during dry months to become problematic in regard to growth and potential for community expansion (SCPL n.d.: 1).

In 1945, the state recognized a water shortage in Santa Cruz and authorized an investigation of available water resources. In 1946, the acute nature of the water crisis prompted the community to request a survey to determine an inventory of the available groundwater supply and plan for growth in the future. Completed In 1948, the survey determined that although the San Lorenzo pumping plant was running at full capacity, 24 hours per day during the dry summer of 1947, the river was so low that the entire run was being diverted through the pumps and into the City mains for consumption (SWRCB 1953: 57; Brown and Dunlap 1956: 1–2).

Prompted by these concerns, in 1953, the State Water Resources Board released a report that inventoried available surface and underground water sources in the County and projected increased water utilization that exceeded the available water in Pajaro Valley, the Soquel Creek area, and the coastal area around and including Santa Cruz. The report identified requirements for supplemental water for Santa Cruz and areas served by the City of Santa Cruz Water Department (SWRCB 1953: 57).

The County formed the Santa Cruz County Flood Control and Water Conservation district in 1955 and hired Creegan & D'Angelo Civil Engineers in 1956 to complete an extensive survey identifying dam sites, groundwater sources, and additional steps to improve control of the water supply throughout the County to compete with the City's proposals. The report asserted that population growth was a major concern for the water supply in the City because "the City of Santa Cruz has current water requirements which equal the capacity of the existing water supply system during a relatively dry era. Should an exceptionally dry season be experienced, there would be a serious water shortage in the City of Santa Cruz" (Creegan and D'Angelo 1957: 8).

Present supplies were determined to be insufficient for standard rates of population growth, including years that rainfall was considered more plentiful. Despite the rate of water consumption in the service area tripling between the mid-1930s and mid-1950s, there had been no additions to the municipal water supply during that time. Creegan & D'Angelo would also serve as the engineers for the Santa Cruz County Flood Control and Water Conservation District Advisory Committee, and ultimately, their recommendation to the council to remedy the current water crisis in the City was a dam on Newell Creek (Santa Cruz Sentinel 1953: 1, 1954: 1, 1958a: 4).

A number of general obligation and revenue bonds helped to fund a wide range of water-related projects in Santa Cruz during this period, including routine maintenance and transmission line replacements, but also projects such as the Graham Hill Treatment Plant (1959), Newell Creek Dam (1960), the Tait Street Diversion (1961) and the Felton Diversion Station (1976). The need for these projects was driven by the need for more water to support a growing, post-war population, but the use of bonds allowed for flexibility to project for future growth. In 1974, the *Santa Cruz Sentinel* surmised that "successful bond issues in 1958, 1963 and in 1967 reflected public confidence in the water administration and a recognition of the needs for more water, apparently, for there was relatively little difficulty getting approval" (Santa Cruz Sentinel 1974: 1–2).

3.2.3.5.1 Newell Creek Dam (1960, modified in 1985)

As a surface water storage on Newell Creek became a distinct reality following the recommendations of Creegan and D'Angelo, City Water Department Director, Weston Webber, voiced his support for the project in 1957. Ultimately, of the five proposed dams, only the Newell Creek Dam would come to fruition (Santa Cruz Sentinel 1957a: 1, 1957b: 13, 1957c: 12).

In 1958, the University of California Regents announced that they were considering the Cowell Ranch in the City of Santa Cruz as the site of a future University of California Campus. The City would be required to provide services and facilities for the prospective University community, which early figures suggested was to include around 2,500 students. In anticipation of the Water Revenue Bond Election in November 1958 to approve the bonds necessary to construct the Newell Creek Dam, a new water treatment plant, and pipelines to transport the water, the Santa Cruz Sentinel published an article outlining the impact of the proposed bonds. In reference to the speculative University in the City, the closing paragraph of the article states that "University officials know that the present water supply of Santa Cruz is inadequate, even for normal needs. Failure to correct this situation could end all chance of the selection of Santa Cruz as the University site." (Santa Cruz Sentinel 1958b: 1, 1961a: 1, 1961b: 1).

On November 5, 1958, the voters of the City of Santa Cruz approved $5.5 million in water revenue bonds necessary for the City to purchase 2,162 acres of land in the Newell Creek watershed from the San Lorenzo Valley Water District and build a dam on the site. Creegan & D'Angelo designed the earthfill dam (SCWD n.d.: 2; Santa Cruz Sentinel 1958a: 4).

Contractors Williams and Burrows Inc. of Belmont, California, began the construction of the Newell Creek Dam and preparation for the creation of Loch Lomond in 1960. The early stages of planning and execution were made more difficult by the narrow valley, allowing only one road for ingress and egress for equipment and supplies. The construction of the 195-foot-tall earthfill dam began with a "grout curtain" that pushed concrete 100 feet into the bedrock to fill any fissures or imperfections, ensuring a structurally sound base. The height and width of the dam's crest was first determined by the reinforced concrete ends. The embankment was then built up using successive layers of random fill from the immediate area, compacted with sheepsfoot tampers above and around the 300 feet of impervious material at the core of the embankment. Four construction personnel lost their lives in October 1960 during the layered construction of the embankment. A brass plaque commemorating these men was commissioned and remains today on the southwest elevation of the Control House (Santa Cruz Sentinel 1960b: 15, 1960e: 1).

The Newell Creek Dam was completed and filling steadily with water by 1961; however, the recreation area on the resulting reservoir was yet to be built. Keeping with the Scottish naming tradition started by Scotsman John Burns when he christened the mountain Ben Lomond in the 1850s, the reservoir was dedicated Loch Lomond during two days of festivities on July 27 and 28, 1963 (Santa Cruz Sentinel 1963: 1).

By 1964, the City distributed a notice to bid on the construction of the Loch Lomond Recreation Development. With the help of a $149,000 state grant, the Loch Lomond Recreation Area was completed by the spring of 1965. It included picnic areas, a concessions building, parking areas, two docks, and a boat launch. An all-weather road leading from Lompico to the Recreation Area was a crucial improvement constructed during this phase of the Project. It allowed visitors to experience the new recreation activities available at Loch Lomond, while simultaneously comprehending the realities of water storage and use in the county (Santa Cruz Sentinel 1964: 3).

3.3 Development of the Newell Creek Pipeline (1961)

Planning for the NCP began in conjunction with the development of the Newell Creek Dam and the GHWTP following the approval of $5.5 million in water revenue bonds by Santa Cruz voters in November 1958. The City selected Brown and Caldwell Civil and Chemical Engineers (Brown and Caldwell) to design the NCP and select the alignment of the proposed structure intended to carry reserved water from the Loch Lomond Reservoir to the GHWTP. Although the NCP was planned to work in tandem with the planned Newell Creek Dam system, Brown and Caldwell were not responsible for planning and design of the Newell Creek Dam and its associated components. Brown and Caldwell were, however, also responsible for the design of the GHWTP, which was completed in 1959 (SCWD n.d.: 2; Santa Cruz Sentinel 1958a: 4).

In October 1959, the City received a ROW agreement from the State of California for approximately 15,000 feet of the NCP to pass through the newly formed Henry Cowell Redwoods State Park south of Felton. The ROW agreement included the stipulation that the City would fund the construction of a graded maintenance road alongside the NCP (today known as Pipeline Road), including the installation of wharf hydrants supplied by the state along the route. The ROW agreement also stipulated that the NCP project would supply the park with untreated water in anticipation of a campground being planned on the southern area of the park. Brown and Caldwell began a survey of this area in late 1959 to determine the most strategic alignment of the NCP, which would be decided based on the existing terrain of the Henry Cowell Redwood State Park (Santa Cruz Sentinel 1959: 7).

The segments of the NCP directly north of Felton were planned along a section of the former Felton and Pescadero Railroad bed that was decommissioned in 1934. This section of the former railroad path heads northwest from Henry Cowell Redwoods State Park where the tracks met the former Santa Cruz and Felton Railroad tracks, beneath Zayante Creek, and diagonally across Graham Hill Road and Mt. Herman Road to the beginning of San Lorenzo Way from whence the NCP traveled northwest. This section of road includes multiple culverts which dated to the construction of the railroad in 1885.

The City requested bids for the construction of the NCP in April 1960. The notice to bidders specified “the construction of approximately 3,700 feet of 27-inch, 44,000 feet of 22-inch, 8,797 feet of 20-inch, and 1,151 feet of 18-inch pipelines with appurtenances; and of approximately 15,000 feet of access road with culverts and other necessary appurtenances” (Santa Cruz Sentinel 1960a: 18). The bid was awarded to the Granite Construction Company of Watsonville. Clearing work for the NCP path began in June 1960, and construction of the NCP began in July 1960 at the GHWTP, which was also designed by Brown and Caldwell and completed in 1959. From there, the NCP extended north along Graham Hill Road (Exhibit 9) before ducking into Henry Cowell Redwood Park at Simms Road. The various widths of the 9.25-mile pipeline used for the project were a concrete cylinder pipe material, which is composed of a steel cylinder lined with cement mortar on the interior and is wrapped with a mild wire and coated with dense cement mortar. The NCP was completed later in 1960 (Santa Cruz Sentinel 1960a: 18, 1960c: 14, 1960d: 5)

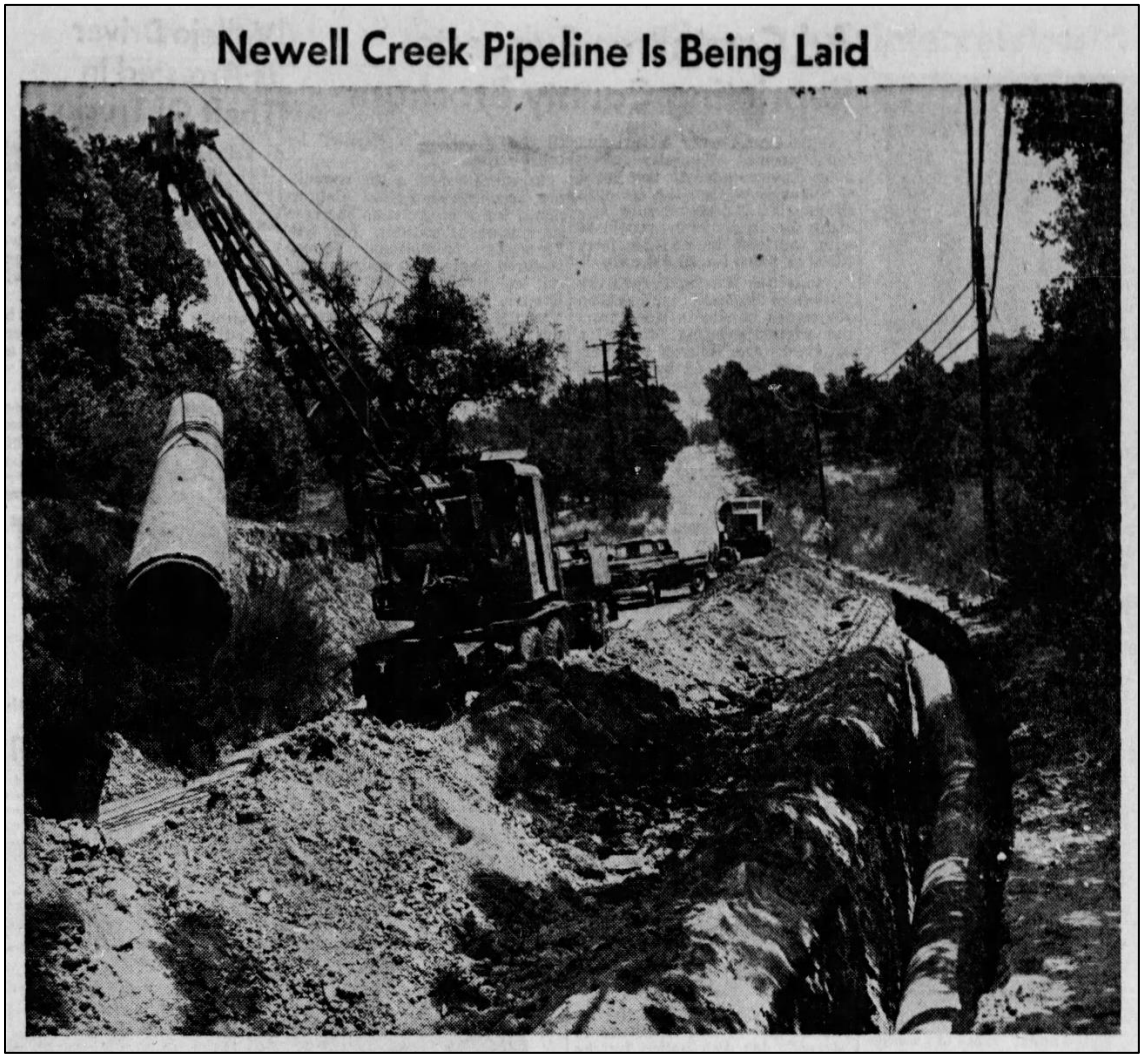


Exhibit 9. A photograph of the Newell Creek Pipeline being laid along Graham Hill Road in July 1960 (Santa Cruz Sentinel 1960d: 5).

In January 1968, the City completed construction of a supplemental pipeline in the Henry Cowell Redwood State Park to distribute water to the public campground being completed in the southern section of the park. The construction of the 8-inch pipe was an obligation stipulated by the state in exchange for the 1958 ROW through the park (Santa Cruz Sentinel 1967: 2).

In January of 1982, a powerful storm caused a major landslide in the Brackney section of the NCP, which caused the disruption of the service for several weeks. The NCP was promptly repaired, but the incident renewed community attention to the potential for the aging components of the municipal system to require upfront repair and maintenance, which prompted community support for funding measures to update and modernize other major infrastructure elements beginning in 1984. In 2017, the Brackney section was again subject to damage caused by heavy rains and land slide activity. In 2020, the northern-most segment of section of the NCP between the Newell Creek Dam and the southern end of the Newell Creek Access Bridge was replaced as part of the Newell Creek Dam Inlet/Outlet Replacement Project (Santa Cruz Sentinel 1982: 1, 8, 1984: 3, 1985: 11; Cardona and Associates 1982; SCWD n.d.: 2).

3.4 Engineers: Brown and Caldwell Civil and Chemical Consulting Engineers (1947-Present)

Engineers Kenneth Brown and David Caldwell founded Brown and Caldwell Civil and Chemical Engineers in 1947 in San Francisco, California. The firm specialized in surveys and consultation related to water supply management and treatment, and in the design of sewer and water treatment infrastructure, water and sewage treatment plants, and delivery pipelines.

The firm is presently still in operation and continues to provide a wide selection of services related to "Safeguarding Water, maintaining infrastructure and restoring habitats" (Brown and Caldwell 2021).

A representative selection of projects completed by Brown and Caldwell is presented below (Colfax Record 1949: 4; Napa Journal 1949: 7; Press Democrat 1951: 1; Ukiah Daily Journal 1957: 9; Daily Independent Journal 1958: 11; Sacramento Bee 1960: 18):

- Auburn Domestic Water Treatment Plant (consulting engineers), Auburn, California (1949)
- Conn Water System Investigation (consulting engineers), Napa County, California (1949)
- Santa Rosa Sewer Plant (consulting and designing engineers), Santa Rosa, California (1951)
- Ukiah Treatment Plant (designing engineers), Ukiah, California (1957)
- South Tahoe Public Utility District Sewage Treatment Plant (consulting engineers), South Lake Tahoe, California (1960)

3.5 Contractors: Granite Construction (1900-Present)

During the mid-to-late nineteenth century, the simultaneous development of railroads across the United States caused the demand for granite stone to increase steadily as it was considered integral to the installation of tracks, which helped to level the railroad tracks and evenly distribute the weight of passing trains. Following the discovery of a granite quarry on James Harvey Logan's ranch property outside of Watsonville, California, John T. Porter, his son, Warren Porter, and A.R. Wilson saw it as a financial opportunity and purchased the quarry from Logan for $10,000. Together they established the Granite Rock Company in 1900 (Granite Construction 2021).

The devastation wrought by the 1906 earthquake presented a unique opportunity for the young company, which found that granite was now in heavy demand as a building material. New laws encouraging the surfacing of roads and sidewalks between 1907 and 1910 prompted further growth, and by 1909, the Granite Rock Company employed 110 men. The onset of World War I, however, quickly presented setbacks as 20% of the nation's production was allocated to wartime needs. The company weathered World War I through the implementation of storehouses along the rail lines to meet the demand for more minor projects (Granite Construction 2021).

The economically slow period prompted the company to restructure following the end of the war and begin branching out into the construction aspect of the trade instead of simply the material supply. The company formed the Granite Construction Company in 1922, which was a subsidiary devoted to the construction arm of the business headed by Walter J. Wilkinson. Although the Great Depression tested the company, the prosperous period following World War II resulted in unprecedented growth for the company. Granite expanded outwards from Watsonville,

establishing branch offices in Monterey, California, in 1945 and Santa Cruz, California, in 1946. The company continued to expand during the second half of the twentieth century, moving into new construction ventures including major highways, dams, water infrastructure, and rapid transit stations in California, but gradually in Texas, Florida, New York, and Washington D.C. Today, the company operates as a diversified company incorporating both the construction and construction material aspects of projects encompassing transportation and water infrastructure (Granite Construction 2021).

A representative selection of projects completed by Granite Construction is presented below (Granite Construction 2021):

- Carnegie Library, Watsonville, California (1903)
- Santa Cruz Courthouse Annex (1907–1910)
- Monterey Odd Fellows Building (1907–1910)
- Road to Glacier Point, Yosemite National Park, California (1936)
- Surfacing of Highway 99 near Elk Grove, California (1955)
- Interstate 80 between San Francisco and Squaw Valley, California (1957)
- Donner Pass, Nevada County, California (1965)
- Rollins Dam, Nevada, and Placer counties (1965)
- Portion of the California Aqueduct (1965)
- Powel Street Station, San Francisco, California (1972)
- San Joaquin Toll Road (CA-73), Orange County, California (1996)

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4 Significance Evaluation

To assess the NCP's historical significance and integrity, the pipeline was recorded and evaluated in consideration of NRHP, CRHR, and SCCHRI designation criteria and integrity requirements. A physical description of the structure and its development history is provided below. The property significance evaluation was prepared by Dudek Architectural Historian Fallin Steffen, MPS, who meets the Secretary of the Interior's Professional Qualification Standards for architectural history. The complete DPR 523 form set is provided in Appendix F.

4.1 Newell Creek Pipeline (1960, Repaired 1982, 2017)

Property Description

The NCP is 9.25 miles long and located in the unincorporated areas of Santa Cruz County. Access to the NCP is provided via Newell Creek Road, Glen Arbor Road, Brackney Road, San Lorenzo Way, Rose Acres Lane, Graham Hill Road, Mount Hermon Road, State Route 9, Pipeline Road (a paved trail through Henry Cowell Redwoods State Park), and via existing City easements. The NCP is oriented roughly north/south and is predominately underground as it passes through densely forested areas and residential properties. The NCP daylights at approximately three locations along the route (Exhibit 10).



Exhibit 10. View of one of the points where a segment of the NCP is visible (red arrow) as it crosses a culvert under Pipeline Road within Henry Cowell State Redwood Park (DSCN6723)

To document various segments of the NCP, including the variety of materials and features, as well as the surrounding setting of each segment, the structure was recorded at multiple points within each of the existing

segments discussed in Table 5 below. Recordation of the NCP began at the northernmost point (Datum P-NCR_1) and continued until the southernmost point (Datum P-GRS_2). The Datum location key and all corresponding photographs are recorded in the DPR forms provided in Appendix F.

Table 5. Newell Creek Pipeline Existing Segment Survey Summary

Existing Segment (*Abbr.*)	Description	Photograph
Newell Creek Road *(NCR)*	Segment runs along Newell Creek Road from the Newell Creek Access Road Bridge and bypassing the intersection of Newell Creek Road and Glen Arbor Road by heading due south between homes before reemerging at Glen Arbor Road.	 Datum P-NCR_1, view looking north (DSCN6303)
Glen Arbor Road *(GAR)*	The NCP continues south onto Glen Arbor Road and continues south through an existing easement until meeting the north end of the Brackney North Section.	 Datum P-GAR_1, view looking north (DSCN6335)

Table 5. Newell Creek Pipeline Existing Segment Survey Summary

Existing Segment (*Abbr.*)	Description	Photograph
Brackney North (BN)	Runs along an abandoned Felton and Pescadero Railroad bed alongside the San Lorenzo River between a Glen Arbor Road neighborhood and the Brackney Road neighborhood.	 Datum P-BN_1, view looking northwest (iPad P-BN-1a)
Brackney South (BS)	Extends south from the Brackney North Section abandoned Felton and Pescadero Railroad bed and partially along unpaved easement and before ending at the property boundary at north end of San Lorenzo Way/Rose Acres Lane.	 Datum P-BS_1, view looking north (iPad P-BS-1a)
San Lorenzo Way (SLW)	Runs from north to south end of San Lorenzo Way/Rose Acres Lane and through private property to the edge of Mount Hermon Road.	 Datum P-SLW_1, view looking southeast (DSCN6277)

Table 5. Newell Creek Pipeline Existing Segment Survey Summary

Existing Segment (*Abbr.*)	Description	Photograph
Felton Booster Pump Station (FBS)	Crosses Mount Hermon Road and runs diagonally through the southwest corner of the commercial parking lot before joining and following Graham Hill Road southeast to the Felton Booster Pump Station.	 Datum P-FBS_2, view looking northwest (iPad P-FBS_2a)
Graham Hill Road North (GHN)	From the Felton Booster Pump Station, crosses beneath Zayante Creek, runs alongside Graham Hill Road before heading southward past the Santa Cruz Lumber Company into Henry Cowell Redwood State Park.	 Datum P-GHN_1, view looking northwest (DSCN6379)
Pipeline Road (PR)	The NCP heads roughly southeast through the park before exiting Henry Cowell State Park and meeting Graham Hill Road at the intersection of Graham Hill Road and Pipeline Road.	 Datum P-PR_3, view looking north (DSCN6592)

Table 5. Newell Creek Pipeline Existing Segment Survey Summary

Existing Segment (*Abbr.*)	Description	Photograph
Graham Hill Road South (GRS)	Follows Graham Hill Road from southern entrance of Henry Cowell Redwoods State Park to terminus at GHWTP.	 Datum P-GRS_1, view looking north (PC160048)

Appurtenances related to the NCP including air vents, valve access boxes, wharf hydrants, culverts, the cathodic protection box (now abandoned), and a meter pit are also visible along the route. These features are described generally in Table 6 below.

Table 6. Newell Creek Pipeline Associated Appurtenances

Appurtenances	Description	Photograph
Air Vent: Type A	Metal air vent extending from the ground. The majority of the original vent heads (top) have been replaced with smaller, PVC vent heads (bottom).	 Air vent with original head (DSCN6537)

Table 6. Newell Creek Pipeline Associated Appurtenances

Appurtenances	Description	Photograph
		 Air vent with replaced head (iPad V-NCR_1a)
Air Vent: Type B	Tall (over 10 feet) metal air vent with curved vent head and back flow valve.	 (DSCN6512)
Valve Access Box	Concrete vault box with corresponding metal access covers.	 (iPad P-BN_1b)

Table 6. Newell Creek Pipeline Associated Appurtenances

Appurtenances	Description	Photograph
Wharf Hydrants	Metal fire hydrant extending from the ground with the upper section painted yellow.	 (DSCN6401)
Culverts	New and historic culverts along the pipeline route are constructed from a variety of materials including concrete (top), corrugated metal, corrugated PVC material, and in one instance within the Brackney South Segment, a wood culvert that was originally constructed in conjunction with the Felton and Pescadero Railroad in 1885 (bottom).	 Concrete Culvert (DSCN6222)  Wooden Culvert (DSCN6231)

Table 6. Newell Creek Pipeline Associated Appurtenances

Appurtenances	Description	Photograph
Cathodic Protection Box (abandoned) and Meter Pit	The cathodic protection system no longer contains a galvanic anode system and is therefore no longer functioning.	 (DSCN6376)

Identified Alterations

The following list of known alterations was compiled through archival research, a review of previous subject property documentation, and during the pedestrian survey. Unless indicated, the date of these alterations is unknown (Cardona and Associates 1982; Kennedy Jenks 2017):

- Replacement of northern-most segment of section of the pipeline from the Newell Creek Dam to the Newell Creek Access Bridge as part of the Newell Creek Dam Inlet/Outlet Replacement Project (2020)
- Emergency repair and realignment to correct landslide damage within the Brackney North Segment (2017)
- Emergency repair and realignment to correct landslide damage within the Brackney North Segment (1982)
- Disconnection of the Cathodic Protection System (1986)
- Replacement of air vent heads
- Replacement of culvert material

4.1.1 NRHP/CRHR Statement of Significance

NRHP Criterion A: associated with events that have made a significant contribution to the broad patterns of our history

CRHR Criterion 1: is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

Water delivery infrastructure such as water pipelines that are associated with the regional water supply are a common property type throughout the County, the State of California, and the nation. Components of water storage and delivery systems have been considered significant under NRHP Criterion A and CRHR Criterion 1 when they were associated with events that have made a significant contribution to the broad patterns of our history, such as

early advances in water management. Outside of early examples of water management projects, unless the implementation of a water management project can be demonstrated to have contributed significantly to the unique history of the County, state, or nation, development which supports general growth is far too common an association to merit a blanket conclusion of historical significance under NRHP Criterion A or CRHR Criterion 1 within the context of water management systems. The Newell Creek Dam is directly associated with important events that have made a significant contribution to the development of water infrastructure development in Santa Cruz. These important events include concerns over local water shortages in the late 1950s (as documented in state and local water supply reports) leading up to the passage of the Water Revenue Bond in 1958, which approved funding for construction of the Newell Creek Dam in direct response to concerns over water shortages. Archival research also revealed that water shortages in the late 1950s threatened to make Santa Cruz a less than desirable choice for the location of the next University of California, noting that failure to correct water shortage issues could end all chance of the selection of Santa Cruz as the University site. Construction of the Newell Creek Dam gave the City control over the seasonal fluctuations in water availability and became a critical component to the water infrastructure, which supported the sustained growth of the City after World War II (Dudek 2018).

While the NCP was planned simultaneously with the Newell Creek Dam during the late 1950s, the structures were planned by separate engineering companies and constructed by different contractors to work in conjunction with each other as part of the overall, interconnected municipal system. The Graham Hill Water Treatment Plant and the Tait Street Diversion are examples of other system upgrades completed during the same period. The NCP constitutes a ubiquitous, mid-twentieth century addition to the City's existing water system distribution system, and therefore is associated with the period of pervasive expansion which characterized the water systems throughout the nation, state, and County following the end of World War II. As such, this structure is not a physical example of the early water delivery efforts in the County, of which there are extant examples such as the Laguna Creek Dam, nor can it be singularly tied to any one event that has made a significant contribution to the development of the City of Santa Cruz, the County, or the state, as in the case of the Newell Creek Dam.

The NCP, as an expansion of the existing water system, is not associated with any events occurring within the context of County water development that would distinguish the structure from the vast array of water management systems dotting the California landscape. Moreover, research into the history of the NCP revealed no evidence suggesting that the structures are associated with an alternative, more unique event or pattern of events considered historically significant. For these reasons, the subject property does not appear eligible under NRHP Criterion A or CRHR Criterion 1.

NRHP Criterion B: associated with the lives of significant persons in our past.

CRHR Criterion 2: is associated with the lives of persons important in our past.

To be found eligible under Criterion B/2 the property has to be directly tied to an important person and the place where that individual conducted or produced the work for which he or she is known. Archival research failed to indicate any such direct association between individuals that are known to be historic figures at the national, state, or local level and the NCP. The NCP represents the collective efforts of many individuals, rather than the work of any single individual. Therefore, the NCP is not known to have any historical associations with people important to the nation's or state's past. Due to a lack of identified significant associations with important persons in history, the subject property does not appear eligible under NRHP Criterion B or CRHR Criterion 2.

NRHP Criterion C: embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

CRHR Criterion 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.

Overall, the NCP demonstrates simple pipeline construction methods that have been in place regionally since the 1860s. As such, the NCP lacks sufficient distinction to be called significant within any particular water delivery infrastructure type. The NCP was completed in 1960; however, major damage in ensuing years required subsequent alterations, including emergency flood damage repairs in 1983 and 2017, as well as minor realignments and repairs to address leaks and breakages as they arose along the route of the pipeline. These alterations have caused the NCP to retain only diminished integrity of materials and workmanship.

The NCP was planned and designed by Brown and Caldwell Civil and Chemical Engineers of San Francisco, who specialized in the planning and implementation of water delivery and treatment systems. Brown and Caldwell helped to design and implement similar facilities throughout California during the period the NCP was designed and built, and they were also the designers of the GHWTP, which was recommended not eligible for listing in the NRHP, CRHR, and the SCCHRI in 2018. There is no indication that Brown and Caldwell reached the level of notoriety to be considered a masters in the field of engineering, nor does it appear that the NCP is representative of any new advancements or techniques in the field of engineering that were developed by Brown and Caldwell. Overall, the design for the NCP does not appear to be distinctive or innovative. It also does not constitute the first, last or only example of a pipeline designed by Brown and Caldwell for this purpose during the course of their careers.

The Granite Construction Company served as the contractors for the project. In consideration of the firm's work on highly publicized, important projects, such as the construction of the first roads into Yosemite National Park during the 1930s and the California Aqueduct during the 1960s, the NCP cannot be said to qualify as the most representative example of the firm's work overall or even during this period.

Overall, the NCP lacks sufficient engineering distinction to be significant within any particular water delivery and management infrastructure type. Consequently, the subject property does not appear eligible under NRHP Criterion C or CRHR Criterion 3.

NRHP Criterion D: have yielded, or may be likely to yield, information important in history or prehistory.

CRHR Criterion 4: has yielded, or may be likely to yield, information important in prehistory or history.

There is no evidence to indicate that the subject property is likely to yield any additional information important to prehistory or history beyond what is already known. The subject property is also not associated with an archaeological site or a known subsurface cultural component. Therefore, the subject property does not appear eligible under NRHP Criterion D or CRHP Criterion 4.

4.1.2 Santa Cruz County Statement of Significance

1. The resource is associated with a person of local, State, or national historical significance.

As stated in NRHP/CRHR Criterion B/2, archival research did not reveal an association between the NCP and any persons who significantly contributed to the development of the City, state, or nation. Therefore, the facility does not appear eligible under County Criterion 1.

2. The resource is associated with an historic event or thematic activity of local, State, or national importance.

As stated in NRHP/CRHR Criterion A/1, the NCP is not associated with any extraordinary event or events occurring within the context of County water development that would distinguish the structure from the vast array of water management systems dotting the California landscape. Moreover, research into the history of the NCP revealed no evidence suggesting that the structures are associated with an alternative, more unique event or pattern of events considered historically significant. For these reasons, the NCP does not appear to be directly associated with events that have made a significant contribution to the development of water infrastructure in the County. Therefore, the subject property does not appear eligible under County Criterion 2.

3. The resource is representative of a distinct architectural style and/or construction method of a particular historic period or way of life, or the resource represents the work of a master builder or architect or possesses high artistic values.

As discussed in NRHP/CRHR Criterion C/3, the NCP has experienced multiple alterations over time in response to required repairs and modern equipment installation to ensure ongoing use. It is representative of simple earthen mid-century pipeline construction methods and lacks sufficient distinction to be considered significant. The structure is also not associated with the work of a master engineer or master builder and does not possess high artistic values. Therefore, the subject property does not appear eligible under County Criterion 3.

4. The resource has yielded, or may likely yield, information important to history.

As discussed under NRHP/CRHR Criterion D/4, there is no evidence to indicate that the NCP is likely to yield any additional information important to prehistory or history beyond what is already known. The NCP is also not associated with an archaeological site or a known subsurface cultural component. Therefore, the subject property does not appear eligible under County Criterion 4.

Lacking significant associations, the NCP does not appear eligible for listing under SCCHRI.

4.1.3 Integrity Considerations and Significance Summary

National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation (2002) states that the integrity of a property is based upon the historical significance and character defining features of that property, and that "only after significance is fully established can you proceed to the issue of integrity." Upon conclusion that the NCP does not meet any of the required criteria for significance, the structure's current state of integrity is inconsequential. As such, no assessment of integrity is provided in this evaluation.

In conclusion, the NCP does not appear eligible for listing in the NRHP, the CRHR or the SCCHRI. The structure was evaluated in accordance with Section 15064.5 (a)(2)-(3) of California Environmental Quality Act (CEQA) Guidelines and using the criteria outline in Section 5024.1 of the California Public Resources Code, and does not appear to be a historical resource for the purposes of CEQA. It is also not considered a historic property under Section 106.

4.1 Summary of Eligibility Findings in the APE

In conclusion, two historic era-built environment resources were identified in the APE: the NCP and the Newell Creek Access Road Bridge. The segment of the NCP located in the APE was evaluated for listing in the NRHP, the CRHR, or the SCCHRI and was found ineligible under all Criteria. As such, the NCP does not appear to be a historic property under Section 106 of the NHPA or a historical resource under CEQA.

The Newell Creek Access Road Bridge is a concrete access bridge dating from 1960. The bridge was found eligible for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) as a contributor to the Newell Creek Dam Complex under Criterion A/1 at the local level of significance and eligible for local listing under Santa Cruz County Criterion 2. The character defining features of the bridge are limited to its existing dimensions and its continued use as a contributing component of the Newell Creek Dam Complex. As such, the Newell Creek Access Road Bridge is considered historic property under Section 106 of the NHPA and historical resource under CEQA.

5 Application of the Criteria of Adverse Effect

Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on historic properties, assess the effects, and seek ways to avoid, minimize, or mitigate any adverse effects on such properties (36 CFR 800.1[a]). Likewise, CEQA requires a lead agency to determine whether a project may have a significant effect on historical resources (PRC Section 21084.1; CEQA Guidelines section 15064.5[b]).

As stated in 36 CFR 800.5(a)(1), *Criteria of adverse effect*:

> An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

Examples of adverse effects on historic properties include, but are not limited to (36 CFR 800.5(a)(2)):

(i) Physical destruction of or damage to all or part of the property;

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's standards for the treatment of historic properties (36 CFR part 68) and applicable guidelines;

(iii) Removal of the property from its historic location;

(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

The following analysis applies the Criteria of Adverse Effect to Newel Creek Road Access Bridge, the only historic property located in the APE, by providing details of the physical effects that will occur as a result of the Proposed Project, and subsequently explaining why these effects are not adverse to the relevant historic property.

5.1 Newell Creek Access Road Bridge (1960)

The Newell Creek Access Road Bridge was evaluated for historical significance by Dudek as part of the 2018 Historical Resources Evaluation Report for the Newell Creek Dam Inlet/Outlet Replacement Project. The bridge was found eligible for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) as a contributor to the Newell Creek Dam Complex under Criterion A/1 at the local level of significance and eligible for local listing under Santa Cruz County Criterion 2. However, it is not individually eligible for designation. Therefore, the bridge is considered an historic property under Section 106 of the NHPA and an historical resource under CEQA (Dudek 2018).

The access road bridge consists of three spans supported by two pier systems and two abutment systems. It is 135 feet long (45 feet per span), 30 feet wide, and 25 feet high at its maximum height. The roadbed is 26 feet wide (13 feet per lane) with a 1-foot-wide curb on the upstream (north) side and 3 feet wide on the downstream (south) side. Each curb has a metal guardrail on either side, 2 feet 10 inches high, with metal balusters at regular intervals and concrete end-posts atop the abutments on either end of the bridge. In 2018, the City installed signage that reduced the bridge lanes from two to one to meet HS20-44 live loading requirements (Creegan & D'Angelo 1961).

The character defining features associated with this bridge are limited to its existing dimensions and its continued use as a contributing component of the Newell Creek Dam Complex. The historic property boundary for the bridge is limited to the structure footprint. The location of this structure is depicted on Figure 7, Cultural Resources Area of Potential Effects (Dudek 2019).

5.2 Physical Effects of the Proposed Project

The Proposed Project would address identified deficiencies in the NCP conditions to maintain full system functioning without interruption to protect water supply reliability and service. The following text provides brief descriptions of Project Components that may result in physical effects to the Newell Creek Access Road Bridge, which is the only historic property in the APE.

Replacement of the Segment of the Newell Creek Pipeline Attached to the Newell Creek Access Road Bridge

The NCP currently crosses Newell Creek as an attachment to the upstream (western) side of the Newell Creek Access Road Bridge for approximately 116 feet at the northern-most end of the pipeline alignment (Exhibits 11 and 12). The pipeline is supported across the underside of the bridge by nine curved metal hangars and two metal bearings that are attached to the concrete structure by metal bolts (Exhibit 13). The existing pipeline, hangars, and bearings on the bridge would be removed and replaced with a new 24-inch polyvinyl chloride (PVC), ductile iron or high density polyethylene (HDPE) pipeline, and new hangars and bearings in the same location on the bridge, or on the downstream (eastern) side of the bridge. No alterations to the bridge, the bridge alignment, or the use of the bridge are proposed as part of the project.



Exhibit 11. View of the NCP (red arrow) showing the existing hangars (yellow arrows) supporting the pipeline as it crosses beneath the Newell Creek Access Road Bridge, view looking northeast (DSCN6306)



Exhibit 12. View of the NCP as it crosses beneath the Newell Creek Access Road Bridge, view looking southeast (DSCN2812)

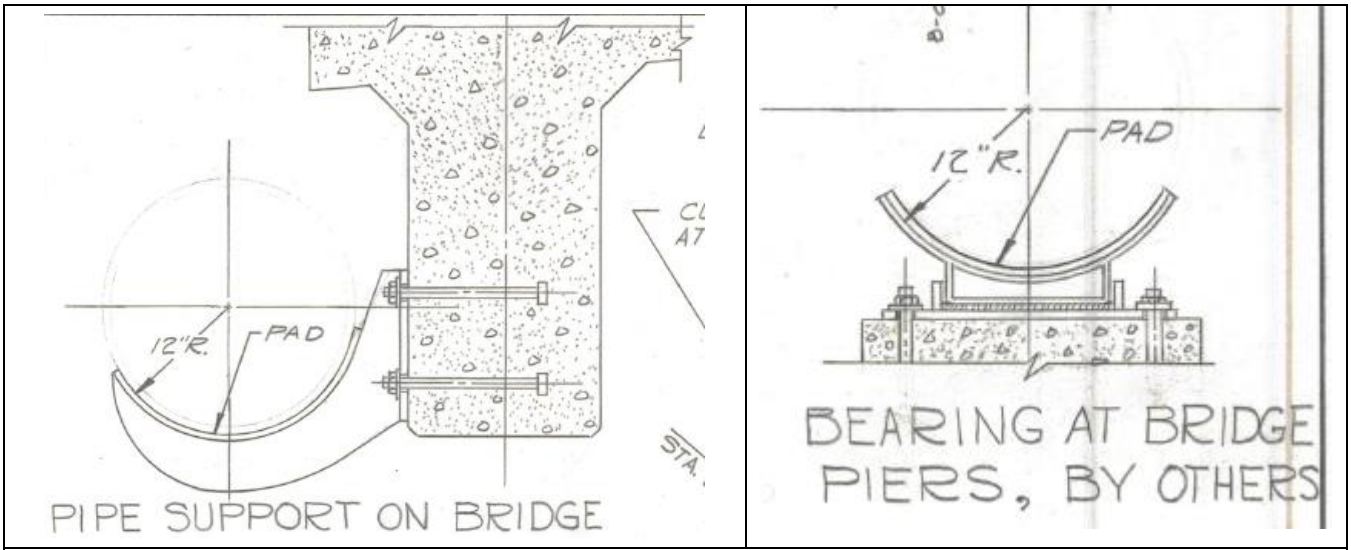


Exhibit 13. Details from the 1960 as-built plans for the NCP showing the existing hangars (left) and bearings (right) supporting the pipeline across the Newell Creek Access Road Bridge (Brown and Caldwell 1960).

5.3 Analysis of Potential Adverse Effects

The Proposed Project activities described above were analyzed in consideration of the adverse effect examples provided in 36 CFR 800.5(a)(2). Specifically, this analysis evaluates the proposed construction modifications noted above that could potentially affect the Newell Creek Access Road Bridge.

(i) Physical destruction of or damage to all or part of the property.

No Adverse Effect.

Project activities that could adversely affect the bridge are limited to the removal of the existing pipeline and support apparatus spanning the bridge. The construction will result in the removal of these materials, which were not originally designed as part of the bridge but rather as components of the NCP that were affixed the existing bridge. The removal of these components would involve non-invasive methods that would allow the bridge to maintain its original orientation, span, materials, and function as a contributing element to the Newell Creek Dam complex. Considering the placement of the new pipeline on the side of the bridge, the new construction would be partially obscured by the existing structure. The new construction will be differentiated from the bridge's historic materials, as modern polyvinyl chloride (PVC), ductile iron or high-density polyethylene (HDPE) materials will be used. Considering that the purpose of the new pipeline structure is to aid in the functionality of the overall Santa Cruz water system reliability and service, and the bridge will continue to function as a component of the Newell Creek Dam complex, the historic property will still retain its character defining features that allow it to convey significance under NRHP Criterion A and CRHR Criterion 1, the effect appears not to be adverse.

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines.

No Adverse Effect.

In reference to the proposed installation of the new NCP to the historic bridge, the Secretary's Standards for the Treatment of Historic Properties indicates that installation of a new or replacement mechanical system, if required, should result in the least alteration possible to the historic building or structure and its character-defining features (NPS 2017: 126). In this case, as noted above, the character defining features associated with the Newell Creek Access Road Bridge are limited to its existing dimensions and its continued use as a contributing component of the Newell Creek Dam Complex. The replacement of the pipeline across the bridge will not impact the character-defining features, ensuring that the bridge can continue to function in its historic capacity as a bridge by providing access to the remote Newell Creek Dam complex.

The new NCP design will not physically detract from the design of the Newell Creek Access Road Bridge, nor will it detract from the bridge's ability to function in its original capacity as an access road bridge, with minimal disturbance of historic materials. The use of modern polyvinyl chloride (PVC), ductile iron or high-density polyethylene (HDPE) materials for the new pipeline structure will create a clear differentiation between historic materials and new construction. These procedures are in line with Secretary's Standards for the Treatment of Historic Properties guidelines for maintenance of historic concrete structures. The Proposed Project design allows the bridge to continue to convey its significance under Criterion A as a contributing component of the Newell Creek Dam Complex. As such, these activities appear to be consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines. Overall, the Proposed Project appears to be consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68), and applicable guidelines and the Proposed Project would not constitute an adverse effect.

(iii) Removal of the property from its historic location.

No Adverse Effect.

The Newell Creek Access Road Bridge will remain in its historic location, all construction work will be conducted within the structure's historic orientation, and so the location of the historic structure will remain intact.

(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance.

No Adverse Effect.

The Newell Creek Access Road Bridge will maintain its current use as an access bridge within its existing remote setting which contributes to a historic water management complex.

(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features.

No Adverse Effect.

While the Newell Creek Access Road Bridge will undergo minor modifications, the action will not introduce visual, atmospheric or audible elements that will diminish the integrity of the structure's significant historic features. The bridge will continue to serve its intended function, in its original alignment and configuration, such that the bridge will continue to convey its significance under NRHP Criterion A and CRHR 1. The modifications to the bridge will not introduce any new incompatible elements that would diminish the integrity of the bridge.

> ***(vi)*** *Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and*

No Potential to Effect.

The Newell Creek Access Road Bridge will not be neglected as part of the Proposed Project, rather, it is, and will remain, a functioning component of the Newel Creek Dam complex.

> ***(vii)*** *Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.*

No Potential to Effect.

The Newell Creek Access Road Bridge is not federally owned.

In summary, the Proposed Project will have **No Adverse Effect** on the Newell Creek Access Road Bridge located in Santa Cruz County.

5.4 CEQA Impacts Analysis

According to CEQA (section 21084.1), a project that could "cause a substantial adverse change in the significance of an historical resource" may have a significant impact. CEQA Guidelines section 15064.5(b)(1) indicates that a "substantial adverse change in the significance of an historical resource" means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource *would be materially impaired*." Subsection (2) further indicates that the significance of a historical resource is *materially impaired* when a project "demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance" that justify its inclusion in or eligibility for listing in the CRHR or its inclusion in a local register.

The Proposed Project would not demolish, destroy, or relocate the Newell Creek Access Road Bridge. Replacement of the existing NCP with a new pipeline would not diminish the integrity of the Newell Creek Access Road Bridge's significant historic features including its original alignment and configuration. The bridge will continue to serve its intended function, such that the bridge will continue to convey its significance under NRHP Criterion A and CRHR 1. The modifications to the bridge will not introduce any new incompatible elements that would diminish the integrity of the bridge. These alterations would not alter the association between the Newell Creek Access Road Bridge and events and broad patterns of water system infrastructure and water supply planning in the City and county for which the bridge has been determined eligible for listing as a historical resource in the NRHP, CRHR, and local County register. Therefore, the proposed improvements would not adversely impact the physical characteristics that convey the historical significance of the Newell Creek Access Road Bridge as none of the improvements would alter the overall historic integrity of the resource. Therefore, the Proposed Project would result in a less-than-significant impact on historical resources.

5.5 Conclusions

As detailed above, a finding of No Adverse Effect is recommended for the historic Newell Creek Access Road Bridge located in the APE as related to the Proposed Project. As such, no further documentation is required for NRHP/CRHR and locally eligible properties when a finding of No Adverse Effect has been reached. Furthermore, the Proposed Project will not result in significant impact on historical resources under CEQA.

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6 Findings and Conclusions

Two built environment structures were identified in the APE. The segment of the NCP located in the APE was evaluated for listing in the NRHP, the CRHR, or the SCCHRI and was found ineligible under all Criteria. As such, the NCP does not appear to be a historic property under Section 106 of the NHPA or a historical resource under CEQA. The recommended Status Code for the NCP is 6Z.

The Newell Creek Access Road Bridge is considered a contributing feature of the Newell Creek Dam complex, which was designed by engineers Creegan and D'Angelo and completed by contractors Williams and Burrows Inc. in 1960. The Newell Creek Dam and its associated features were determined eligible by SHPO in 2019 under Criterion A/1 at the local level and eligible for local listing under Santa Cruz County Criterion 2 for its contribution to the broad patterns of our history because of its integral role supporting future growth leading directly to the selection of Santa Cruz as the location of a University of California campus in the early 1960s (Dudek 2018).

The Newell Creek Access Road Bridge is considered a historic property under Section 106 of the NHPA and historical resource under CEQA. As recommended in section 5.3, the Newell Creek Access Road Bridge will not sustain adverse effects as a result of project construction or implementation. As such, the Proposed Project would have **no adverse effects** on built environment historic properties under Section 106 of the NHPA. Under CEQA, the finding related to the Newell Creek Access Road Bridge as a built environment historical resource would be **less than significant**.

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Appendix A

Newell Creek Access Road Bridge (Newell Creek Dam Complex Contributor): SHPO Concurrence Letter and DPR forms

State of California • Natural Resources Agency Gavin Newsom, *Governor*

DEPARTMENT OF PARKS AND RECREATION Lisa Ann L. Mangat, *Director*
OFFICE OF HISTORIC PRESERVATION

Julianne Polanco, State Historic Preservation Officer
1725 23rd Street, Suite 100, Sacramento, CA 95816-7100
Telephone: (916) 445-7000 FAX: (916) 445-7053
calshpo.ohp@parks.ca.gov www.ohp.parks.ca.gov

July 8, 2019

In reply refer to: COE_2019_0610_002

Danielle Mullen
Senior Regulatory Project Manager
Regulatory Division
U.S. Army Corps of Engineers
450 Golden Gate Avenue, Suite 0134
P.O. Box 36152
San Francisco, CA 94102-3404

Subject: Section 106 Consultation for the Newell Creek Dam Inlet-Outlet Replacement Project in Ben Lomond, Santa Cruz County, California (Corps File No. 2010-00087S).

Dear Danielle Mullen:

The California State Historic Preservation Officer (SHPO) received a letter on June 10, 2019, initiating consultation for the above-named project. The United States Army Corps of Engineers (COE) is consulting pursuant to 36 CFR Part 800 (as amended 8-05-04), the regulations implementing Section 106 of the National Historic Preservation Act. Along with their letter, the COE provided the following documents to support their finding of effect:

- *Historical Resources Evaluation Report for the Newell Creek Dam Inlet/Outlet Replacement Project City of Santa Cruz, Santa Cruz County, California* (Dudek October 2018).
- *Cultural Resources Report for the Newell Creek Dam Inlet/Outlet Replacement Project, Santa Cruz County, California* (Dudek September 2018).

The COE is proposing to authorize the City of Santa Cruz Water Department (Applicant) to perform the proposed project activities under Section 404 of the Clean Water Act (33 U.S.C § 1344). The proposed project includes construction of three new inlets within the Loch Lomond Reservoir, an outlet structure with valves at the toe of the Newell Creek Dam, a new dam seepage collection and monitoring system, a 14-foot diameter tunnel containing new inlet/outlet pipelines through the right (west) dam abutment and under the dam, a new control house on the dam crest, and a new culvert crossing at the spillway plunge pool. Additionally, the project will include dredging within the reservoir, replacement of a 2000-foot segment of the existing Newell Creek Pipeline, and decommissioning the existing inlet/outlet works. The COE has defined their Area of Potential Effect (APE) as encompassing 60 acres consisting of the existing Newell Creek Dam, the southern portion of the Loch Lomond Reservoir, the spillway plunge pool and

State of California ♘ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code 3S/3CS/5S1

Other Listings
Review Code Reviewer Date

Page 1 **of** 23 ***Resource Name or #:** Newell Creek Dam Complex
P1. Other Identifier: Newell Creek Dam; Loch Lomond Recreation Area

*__P2. Location:__ □ **Not for Publication** ■ **Unrestricted**

***a. County** Santa Cruz **and** (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Felton **Date** 2015 **T** 9S ; **R** 2W ; _ □ **of** ___ □ **of Sec** ; **B.M.**

c. Address Loch Lomond City Santa Cruz Zip 95005

d. UTM: Zone 10S, 582329 mE/ 4106694 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, decimal degrees, etc., as appropriate
Elevation 180 ft. amsl.

***P3a. Description:**

The Newell Creek Dam is located in Santa Cruz County approximately 10 miles north of the City of Santa Cruz (City). The Project site is located at the northeast extent of Newell Creek Road, in the County of Santa Cruz, California. The site is bounded by Loch Lomond on the northeast, rolling hills to the east and west, and the Newell Creek drainage to the south. The Newell Creek Dam contains seven associated built environment features: the Newell Creek Dam (1958) and its associated spillway (1958, altered 1985), control house (1958) bridge over spillway (1958, replaced 2018), valve and outlet works (1958, 1960), and access road bridge (1958). (See Continuation Sheet)

***P3b. Resource Attributes:** HP21. Dam

***P4. Resources Present:** □ Building ■ Structure □ Object □ Site □ District □ Element of District □ Other

P5a. Photograph or Drawing

P5b. Description of Photo: Crest of Dam, view looking west (IMG 0266)

***P6. Date Constructed/Age and Source:** ■ Historic □ Prehistoric □ Both: 1960

***P7. Owner and Address:**
City of Santa Cruz
1240 N. Rosecrans Ave., Ste. 120
Manhattan Beach, CA 90266

***P8. Recorded by:** (Name, affiliation, and address) Fallin Steffen, Kate Kaiser, Dudek
725 Front Street, Suite 400
Santa Cruz, CA 95060

***P9. Date Recorded:** 2/19/2018

***P10. Survey Type:** (Describe) Intensive

***P11. Report Citation**: (Cite survey report and other sources, or enter "none.")
Steffen, Fallin, Kate Kaiser, and Samantha Murray. 2018. *Historical Resources Evaluation Report for the Newell Creek Dam Inlet-outlet Replacement Project, Santa Cruz, California.* Prepared for City of Santa Cruz by Dudek.

***Attachments:** □NONE ■Location Map ■Continuation Sheet ■Building, Structure, and Object Record
□Archaeological Record □District Record □Linear Feature Record □Milling Station Record □Rock Art Record □Artifact Record
□Photograph Record □ Other (List):

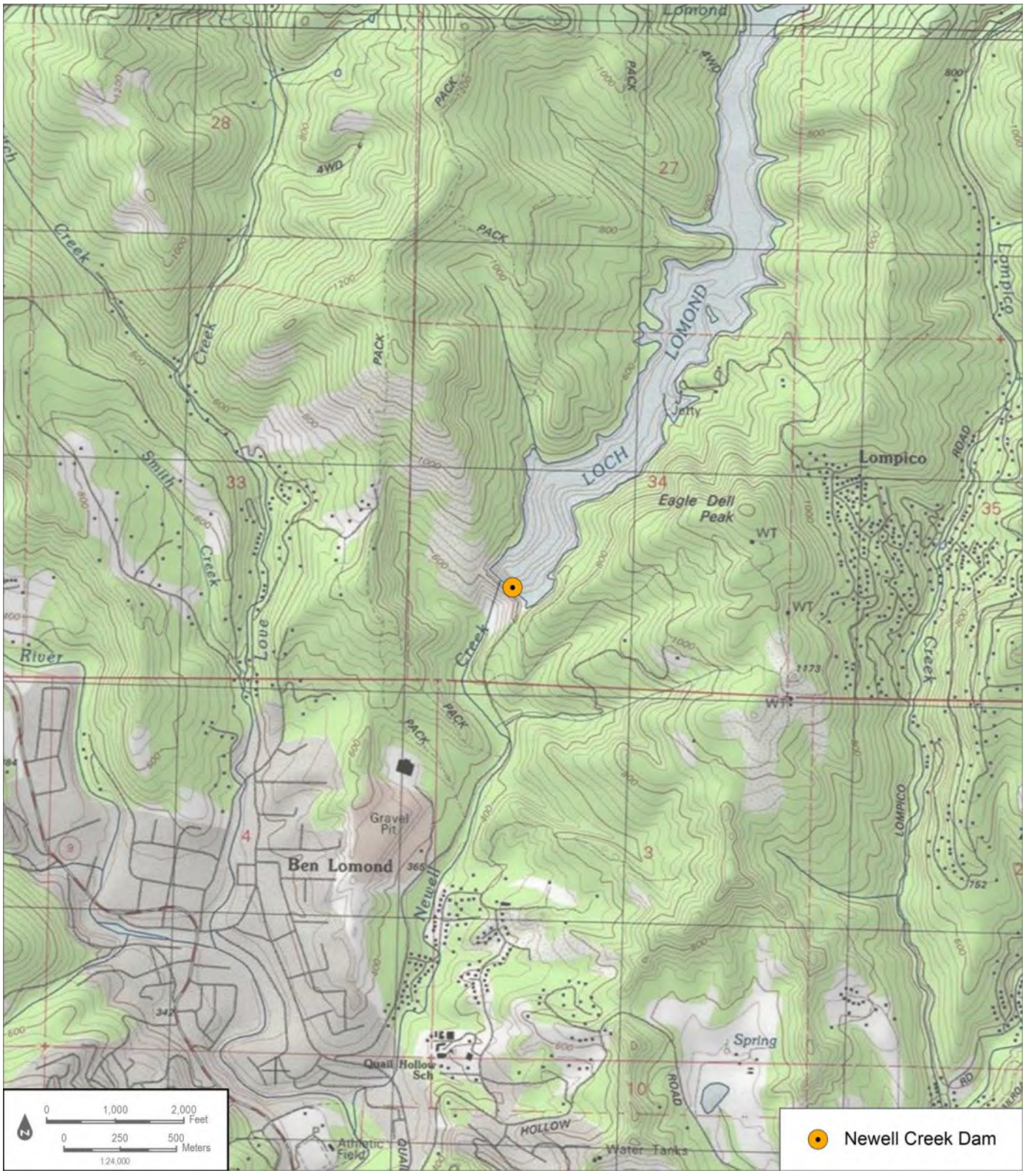
State of California ♁ Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI#

Trinomial

Page 2 **of** 23 ***Resource Name or #** (Assigned by recorder) Newell Creek Dam Complex
***Map Name:** Felton, CA, USGS 7.5' Quad ***Scale:** 1:24,000 ***Date of map:** 2015



BUILDING, STRUCTURE, AND OBJECT RECORD

***Resource Name or #** (Assigned by recorder) Newell Creek Dam Complex ***NRHP Status Code** 3S/3CS/5S1

B1. Historic Name: Newell Creek Dam
B2. Common Name: Newell Creek Dam
B3. Original Use: Dam B4. Present Use: Dam
***B5. Architectural Style:** Earthfill Dam
***B6. Construction History:** (Construction date, alterations, and date of alterations)
Constructed in 1960. Recreation area completed by 1965. A pipeline was relocated in 1984 after a section burst and required repairs. In 1985, the spillway wall was extended to comply with updated safety standards and a permanent aerator was installed. The buildings and the dock in the recreation area were systematically removed and replaced between 1981 and 1984. In 2018, the bridge over the spillway was replaced.

***B7. Moved?** ■**No** □**Yes** □**Unknown** **Date:** **Original Location:**
***B8. Related Features:**
B9a. Architect: Creegan and D'Angelo Civil Engineers b. Builder: William & Burrows Inc.
***B10. Significance: Theme** Local Water Development **Area** Santa Cruz City

Period of Significance 1960 – 1985 **Property Type** Dam **Applicable Criteria** NRHP/CRHR A/1 and City 2

Development in the San Lorenzo Valley

Several miles north of the evolving city center at the base of the Santa Cruz Mountains, the San Lorenzo River carves a deep valley through the dense redwood and oak timberlands. The communities located in these outer reaches of present-day Santa Cruz County owe their existence to the various industries that sought to profit from the wealth of raw resources found here. The extent of the virgin forests in the San Lorenzo Valley and the rich underground deposits of lime attracted opportunistic settlers and purveyors who sought to harness the power of the San Lorenzo River and its many tributaries to move their goods to market locally, throughout California, and the world.

The earliest men to profit from the land in the area were the owners of the various Mexican Land Grants that divided the San Lorenzo Valley. The first power sawmill in California was built on Rancho Zayante by owner Isaac Graham and was driven by the waters of Zayante Creek (SCEN 1936; Robinson 2012). Isaac E. Davis and Albion P. Jordan of the Davis and Jordan Lime Company purchased Rancho Cañada del Rincon in 1859 as a promising quarry site. (See Continuation Sheet)

B11. Additional Resource Attributes:
***B12. References:** See Continuation Sheet
B13. Remarks:
***B14. Evaluator:** Fallin Steffen, Dudek
***Date of Evaluation:** 6/28/2018



(This space reserved for official comments.)

***Required information**

***P3a. Description (Continued):**

Several features of the dam, such as the outlet conduit, the intake structure, and the closure block are underwater within the earthen structure of the dam, and/or otherwise not readily visible and recordable for the purposes of this evaluation. There are several non-historic resources also associated with the dam: the weather station, the metal storage container, and the concrete stream ford.

Newell Creek Dam (1958)

The Newel Creek Dam crest itself is roughly 15 feet from the centerline for its entire width (approximately 30 feet wide total). The dam height was 195 feet from the ground surface in the drainage basin. The total length of the crest was approximately 750 feet from the spillway to the northwest terminus. Though not visible during the February field visit, the width of the dam at the toe was originally planned and constructed to be 1,335 feet, not accounting for soil creep and slippage over time. The pitch of the slope on the northeast (upstream/Loch Lomond) side was built at gentle slope of 1 foot drop every 3 feet, or 3:1 ratio. The pitch of the slope on the southwest side (downstream) was much steeper at 2:1 before becoming a gentler slope further downslope at 3:1. The dam is constructed of several different types of fill: impervious fill on the innermost section, random fill over French drain fill in the Loch Lomond side, and pervious fill over upstream-random fill on the downstream side of the dam. The crest of the dam is constructed of the same impervious fill and topped with a prime coat (Creegan & D'Angelo 1961a).

Spillway (1958, Altered 1985)

The spillway consists of several components that work together to only allow water to let out from the dam when the water level reaches over a certain height, relieving pressure against the extant dam structure and controlling the water that threatens to overtop the dam. The components are an inlet channel, which moves water away from the dam crest and toward the spillway, located at the southeastern terminus of the dam. Water in the inlet channel is stopped by the weir crest of the spillway, a concrete wall rising a few feet above the floor of the approach channel and spillway. There is a rounded concrete feature at the top of this wall called the weir. The weir crest extends the width of the spillway and is 16 feet 4.8 inches feet long. The spillway tapers from 65.52 feet wide at the weir crest to 14 feet wide for the length. Its total length is 592 feet and drops 154 feet in elevation from the weir crest to the bottom of the outlet footing. Its original height was 11 feet maximum, 5 feet minimum according to Creegan & D'Angelo's drawings. The original spillway walls were constructed of board-formed concrete, which the basin was concrete slab.

In 1985, the height of the spillway was raised in response to a large storm and subsequent flooding event. The 1985 material is cast concrete of concrete slab, and raised the wall height long its length between 2 feet and 6 feet at the top 250 feet of the spillway near the weir crest and spillway bridge. The steep slope section of the spillway was left unaltered. The slope of the spillway changes from 5% at the top to 48% down the length of the spillway to the outlet. The spillway outlets several feet above an oblong pond at the foot of the dam's downstream (southwest) side. The pond appears natural but has several road features forming a ford and a barrier separating it from the outlet of Newell Creek, which flows from the outlet conduit (Creegan & D'Angelo 1961b, 1984).

Control House (1958)

The control house is a rectangular plan, one-story, single-room building with a shed-style roof. The control house building footprint measures 9 feet 4 inches wide by 20 feet long. The building is constructed of concrete masonry units arranged in stack

bonds on a concrete foundation. Under the foundation and piercing it is the intake structure and conduit. The roof is a lightly framed nominal lumber and plywood roof, clad in rolled asphalt shingle. The roof is pierced near the northwest side by a ventilation pipe. Attached to the southwest elevation is a commemorative plaque for workers who died during the construction of the dam. The building is devoid of fenestration but has a windowless metal door on the southwest (main) elevation and a second metal door on the northeast elevation with the intake structure leading from the Loch Lomond side of the dam up to the doorway (Creegan & D'Angelo 1961c).

Spillway Bridge (1958)

The spillway bridge provides access from the access road to the Newell Creek dam crest road over the spillway. The bridge is constructed of precast and pre-stressed concrete floor slab units and measures 31 feet 9 inches in length, 20 feet 3 inches wide, and 1 foot thick. The roadbed itself is 18 feet wide and the guardrails are on a concrete curb 1 foot 1.5 inches wide on either side of the bridge. The guardrails are constructed of metal and bolted to the outer edge of the curb. They are 4 feet 8.5 inches from the bottom of the curb to the top of the top railing (Creegan & D'Angelo 1961d).

Valve and Outlet Works (1958, 1960)

The outlet works at the downstream toe of the dam consists of an outlet conduit valve, housed in a large board-formed concrete box. The outlet works are the surface features of an underground concrete outlet conduit running under the dam and controlled by the intake system in the control box in tandem with the outlet valve. The underground conduit is 1,331 feet and 10.2 inches long. It consists of a 3-foot-diameter pipe housed in a semi-circular concrete collar, measuring 6 feet 6 inches maximum width, 5 feet 3 inches tall, and providing at least a 1-foot thick concrete housing reinforced with longitudinal steel bars for the 3-foot-diameter pipe. The concrete housing for the valve and associated pipes at the downstream toe of the dam are all that was visible of the overall outlet conduit in the February field visit. The concrete valve housing measured 17 feet 10 inches long, 6 feet 6 inches wide, and 8 feet 11 inches tall. A portion of the valve housing's length is under the toe of the dam, so approximately 12 of the originally planned 17 feet length is visible, and approximately 4 feet of the original height. On the top side of the concrete house are two metal doors that open outward and provide access to the valve pit. A large 12-inch polyvinyl chloride (PVC) clad pipe emerges from the southwest side of the metal valve housing and leads to a smaller metal housing, roughly 6 feet by 4 feet by 3 feet high. The second metal housing is not listed in the Creegan & D'Angelo plans or in subsequent plans or change orders, and its use is unknown. Beyond the metal box, Newell Creek emerges from a pipe and continues its natural course through the steep drainage basin. Around the outlet features are several spare pipes, as well as little concrete and river rock retaining walls that appear to have once held small pools of water. The use of these pools is unknown and likely decorative (Creegan & D'Angelo 1961e).

Access Road Bridge (1958)

The access road bridge follows the American Association of State Highway Officials Standard Specifications for Highway Bridges according to their 1957 design and construction specifications book. The bridge consists of three spans supported by two pier systems and two abutment systems. It is 135 feet long (45 feet per span), 30 feet wide, and 25 feet high at its maximum height. The roadbed is 26 feet wide (13 feet per lane) with a 1-foot-wide curb on the upstream (north) side and 3 feet wide on the downstream (south) side. Each curb has a metal guardrail on either side, 2 feet 10 inches high, with metal balusters at regular intervals and concrete end-posts atop the abutments on either end of the bridge (Creegan & D'Angelo 1961f).

Recreation Area (1965)
Historic aerial photographs suggests that the buildings which currently stand on the site are not the original shore-side concession structure or docks completed in 1965. The historic docks, three in total, were built from wood and projected from the Recreation Area shoreline. Two of the docks were rectangular in shape and had floor planks that extended lengthwise down the dock. The third dock was more narrow than the others and projected out alongside the boat launch area, terminating in a square platform. Between the boat launch dock and the other docks sat the original Concessions building. It was a one-story building with a large overhanging roof directly on the shore of the lake (NETR 2018; SCS 1979a).

While it is unclear when the original Recreation Area structures were demolished between the 1968 and 1991 historic aerial photos, the City Council agenda announcements suggest that there was a great deal of new construction that took place during that period. The City announced the creation of a new master plan for the Recreation Area in June of 1979. In 1981, the City announced the completion of a new lakeside bathroom. Bids and acceptance of a design proposal were posted in the Santa Cruz Sentinel in 1984 for a new Concessions Building. In 1984, the City requested bids for new docking facilities that were completed and announced again in 1985 (NETR 2018; SCS 1979b; SCS 1981; SCS 1984; SCS 1985).

Presently, there is one large dock in the place of the two, rectangular, wooden ones, and it is constructed of sectional floating polyethylene configured into an 'H' shape. The modern Camp Store building is situated at the head of the dock on the shore of the reservoir to the northeast of where the original Concessions building stood. It is a single-story building clad in wood board-and-batten sided with multiple roll-up door openings. A hexagonal shade structure sits facing the camp store, on the opposite side of the dock entrance. The modern restroom facility building is located to the northeast of the boat launch ramp and is a simple, rectangular, wood-sided building. The Motor Shop is situated further from the edge of the reservoir in the parking lot. It is a rectangular building with a rectangular addition jutting from the rear of the building and appears to be modern construction. Both are clad in tan-colored medium-density fiberboard siding.

***B10. Significance (Continued):**

They also utilized the falling water on the property to process local lumber into fuel for their many kilns (Brown 2011). The California Powder Works was established in 1861 on the bank of the San Lorenzo River on a portion of Rancho Carbonera. The location was chosen for its proximity to lumber, the harbor, and the river, which was harnessed to operate the water-powered machinery needed to process raw materials into explosive powder (Brown 2011; Robinson 2012).

The California Gold Rush of 1848 accelerated the desirability of land in the state and before long, access to water in the drought-prone region took on the highest level of importance. Instead of adopting an equal water access structure in the fashion of the eastern United States, the wealth potential of waterways during the Gold Rush shaped California water law into a "first in time, first in right" system known as Prior Appropriation. Under this system, riparian rights were granted to the first person to use a river or tributary for beneficial consumption like mining, farming, milling or as-needed domestic use. When the original Ranchos in the San Lorenzo Valley were subdivided and sold, access to the rivers and streams was enormously important. Not only did it mean that the initial use set out for a waterway was the primary use, it also meant that any subsequent uses could not supersede or negatively affect the chief use. The order that

claims were recognized during this period established the foundation of the complicated system of water allocation rights still in use today in Santa Cruz County (Pisani 1984).

The number of lumber operations in the county was growing rapidly, and by 1868 there were 12 water-powered lumber mills, 10 steam-powered lumber mills, and 9 shingle mills in operation that needed to transport goods down from remote processing locations. Early roads such as Big Trees Road (now Highway 9) and Graham's Grade Road (now Graham Hill Road) winding from the upper reaches of the San Lorenzo Valley to the wharf were arduous and subject to seasonal weather complications. Navigating the steep angled roads while driving a train of lumber-filled wagons was a dangerous undertaking for even the most experienced teamster (Robinson 2011). In 1873, plans were made for a flume along the San Lorenzo River to easily move the lumber to port. The original plan was for the flume to stretch over 20 miles to the coast, but the dearth of feeder creeks in the lower San Lorenzo basin meant that the river was subject to seasonal dry spells. Instead, when work began on the flume in 1875, a small-gauge railroad from the flume end to the harbor started simultaneously.

The massive projects were completed within a year. The terminus of the 9-mile flume and the new rail line was in Felton, California, where the lumber originating as far as 2 miles north of Boulder Creek, floated down the water-driven flume, and could be loaded onto the train and hauled safely downhill to shore. Overall, the water-powered gravity flume drastically increased the availability of Santa Cruz lumber to a wider market, while the rail line opened up the San Lorenzo Valley to tourism.

Plans for the flume and the general development of the far reaches of the Santa Cruz Mountains meant that pioneers were staking claim to areas that previously had seen little activity. Many of the tributary creeks in these areas bear the names of the first men that settled beside them. Newell Creek was a remote tributary of the San Lorenzo River that was named for an early pioneer, Addison Newell. He established a farm in the steep, v-shaped valley on the banks of the creek in 1870.

The Newell Creek Dam and Loch Lomond

The San Lorenzo River, its tributaries, and the other creeks that wind through the greater Santa Cruz area, has historically been subject to seasonal droughts and floods.

In 1860, two innovative pioneers involved with the early development of Santa Cruz, Fredrick A. Hihn and Elihu Anthony, implored the Board of Supervisors to allow them to dig trenches and lay hollowed 12-inch redwood pipes to transport water throughout the City. Due to Santa Cruz's proximity to vast lumber fields in the San Lorenzo Valley, the redwood pipes were chosen as an inexpensive alternative to iron pipes. The source of the water was to be an 8,000-gallon reservoir on the Mission Santa Cruz hill, and eager recipients of the water could gain access for a fee. By the 1870s, the Hihn-Anthony Water Company was the largest provider of water in Santa Cruz, and Doderero and Carbonero Creeks constituted their primary sources (Brown 2011; Brown and Dunlap 1956).

San Lorenzo Valley Water District

By 1899, Boulder Creek in the San Lorenzo Valley (SLV) was the fifth largest shipper of timber in the country. As the SLV was settled in the mid-1800s, populations in Ben Lomond, Brookdale and Boulder Creek formed their own water systems (San Lorenzo Valley Water District, 2009.). As vacation homes increased in the early 1900s, many small subdivisions in the SLV developed their own water systems. These water systems were designed to serve the needs of Bay Area residents who occupied their vacation homes only a few weeks a year. Nearby springs and creeks supplied these water systems through flumes or pipelines. Santa Cruz County population more than doubled from 1900 to 1940; as more people moved into the

valley, the existing water systems became inadequate (San Lorenzo Valley Water District, 2009).

Frequent droughts between 1912 and 1939 convinced Valley leaders to form a water district to better control water, to serve the needs of the valley. After one failed attempt to form a county water district by election in 1939, the San Lorenzo Valley County Water District (SLVWD) was formed by the voters on April 3, 1941. Negative voter returns from the towns of Felton and Scotts Valley left those areas out of the district boundaries, which included Bear Creek, Boulder Creek, Alba, and Ben Lomond school districts, and part of the Sequoia school district (San Lorenzo Valley Water District, 2009.).

After securing unclaimed water rights in Newell Creek and Bear Creek in 1942, the SLVWD developed a master plan that included storage dams on Boulder, Newell, and Bear Creeks, and the upper San Lorenzo River (San Lorenzo Valley Water District, 2009). In 1945, voters failed to approve a bond proposed to pay for the Boulder Creek dam, and when the District again proposed a bond measure to the voters to fund the construction of a dam at Waterman Gap, a citizens group organized to oppose it. The citizens group also opposed the proposed dam at Newell Creek, and another bond measure was defeated in December 1946. The District purchased the 3,400 acre Newell Creek property, but also pursued purchasing additional water supplies (Ibid.). In 1957, the District proposed a bond issue for purchase of Citizen Utilities, and a Newell Creek dam project was approved by the voters. The District continued negotiating with Citizens Utilities, and also approached the City of Santa Cruz about partnering in construction of a dam on Newell Creek. Negotiations with Citizens Utilities failed, but the City of Santa Cruz agreed to partner with the District in building the Newell Creek dam (San Lorenzo Valley Water District, 2009). In 1959, the District signed an agreement with the City of Santa Cruz, in which the District sold the City its timber and mineral rights to the Newell Creek watershed, in exchange for one-eighth of the water rights from the water stored by Newell Creek Dam (Ibid).

City of Santa Cruz Water Department

When the steam-powered pumping plant installed on the San Lorenzo River in 1880 became the source of repeated water-quality concerns, the Duke Morgan Water Company abandoned the plant and then combined with the Hihn-Anthony Water Company in 1888, forming the Santa Cruz Water Company. This company set about increasing supplies by creating a diversion on Laguna Creek and constructing the Cowell Street Reservoir on Empire Grade. The reservoir was built to hold 60 million gallons, but it was carved into a porous limestone formation known as karst that caused approximately one million gallons of leakage daily. Despite combining sources and creating new ones, it was apparent that seasonal fluctuations in the water supply and inadequate storage facilities were not capable of supporting the population needs. Just two years later, the city started its own water system in 1890. The City's water sources consisted of diversions along Laguna Creek, a pipeline from Laguna Creek to town, and the Cowell Street Reservoir. The City and the Santa Cruz Water Company competed to provide the city's water for a few years, until the City of Santa Cruz purchased the Santa Cruz Water Company in 1916, along with all of its sources and infrastructure (SCMU Review 2016; Brown and Dunlap 1956).

After the City acquired the Santa Cruz Water Company's holdings, the City sought to update their water infrastructure. Although upgrades and additions were added to the several major facilities to increase the quality of municipal water, the overall output was not widely increased between 1916 and 1930. The Bay Street Reservoir was built in 1924 to replace the sieve-like Cowell Street Reservoir. The Lorenzo River Pumping Plant filtered the water from the San Lorenzo and treated it with chlorine, making it safer to drink (Brown and Dunlap 1956).

In the period following the installation of the Bay Street Reservoir, Santa Cruz sought many short-term fixes to the repeated droughts and floods. The Santa Cruz Sentinel featured articles pertaining to water shortages and flood damage throughout the county, despite the Water Departments' "…consistent policy of doing the best [they] could with what [they] have…"(SCS 1939). Low rainfall in winter 1931, prompted the City to drill four wells, "one at the pumping plant and three directly across the river" (Brown and Dunlap 1956:14), to supplement water, but it was not sufficient. Further shortages due to drought meant that the coastal creek sources were not available for delivery to the city system. (Brown and Dunlap 1956).

The years following World War II provoked westward migration and an increase in birth rates, causing the population of California to increase from 6.95 million to 10.65 million between 1940 and 1950. The influx of people put stress on the infrastructure throughout the state, but in Santa Cruz, the growth of the community from 27,430 to 41,680 between 1940 and 1950 meant the familiar seasonal water shortages now presented a serious problem. Articles from the Santa Cruz Sentinel during this time highlight the difficulties the shortages caused during the dry, summer months, when water merely dribbled from municipal taps. In 1945, the state recognized a water shortage and authorized an investigation of available water resources, but the movement was slow to start (SWRB 1953). In 1946, the acute nature of the water crisis prompted the community to request a survey to determine an inventory of the available groundwater supply and plan for growth in the future. In 1948, the survey ordered by Water Superintendent John C. Luthin was completed and the findings were submitted to the City Council. The survey determined that although the San Lorenzo pumping plant was running at full capacity, 24 hours per day during the dry summer of 1947, the river was so low that the entire run was being diverted through the pumps and into the city mains for consumption.

In 1953, the State Water Resources Board finally released a report based on their investigations in Santa Cruz and Monterey Counties, which inventoried available surface and underground water sources in Santa Cruz County, and projected increased water utilization that exceeded the available water in Pajaro Valley, the Soquel Creek area, and the coastal area around and including Santa Cruz. The report identified requirements for supplemental water for Santa Cruz and areas served by the City of Santa Cruz Water Department; 16 possible alternative water resources including a dam site alternative on Newell Creek The report noted that "the present water problem is not due to a shortage of total seasonal supply, but rather to lack of facilities for regulating that supply" (SWRB 1953: 57) due to peak demands during times of minimum stream flows. Deficiencies in seasonal rains would necessitate water rationing by the City; such deficiencies were reported to have occurred in five seasons since 1895, a period of nearly 60 years at the time the report was issued. (U.S. Census Bureau 1940; U.S. Census Bureau 1950; Brown and Dunlap 1956; SCS 1946a; SCS 1946b; SCS 1948; SWRB 1953).

As a direct result of the State Water Resources Board publication, in 1954, the City commissioned a report investigating four of the Water Resource Board's suggested reservoir sites at Laguna Creek, San Lorenzo River, Soquel Creek, and Scott Creek. The report cited the City's current water sources as "barely sufficient to keep pace with the demand imposed by a steadily increasing population" (Brown and Dunlap 1956: 1). These sources, as of 1956, included Laguna Creek, the original City's water resource since 1890, Liddell Spring, Reggiardo Creek, Majors Creek, the San Lorenzo River, and two unnamed wells. Newell Creek Dam and Loch Lomond Reservoir were not among the suggested sites in Brown and Caldwell's 1956 water supply report, and the report suggested Doyle Gulch as the ideal location for a new city water source (Brown and Dunlap 1956; SWRB 1953).

The City Water Superintendent began to investigate reservoir projects at Zayante Creek, Newell Creek, Doyle Gulch, Scott Creek, and Aptos Creek. Meanwhile, the County formed the

Santa Cruz County Flood Control and Water Conservation district in 1955 and hired Creegan & D'Angelo Civil Engineers in 1956 to complete an extensive survey identifying dam sites, groundwater sources, and additional steps to improve control of the water supply throughout the county to compete with the City's proposals. The report asserted that population growth was a major concern for the water supply in the City because "the City of Santa Cruz has current water requirements which equal the capacity of the existing water supply system during a relatively dry era. Should an exceptionally dry season be experienced, there would be a serious water shortage in the City of Santa Cruz." (Creegan and D'Angelo 1957:8). Present supplies were determined to be insufficient for standard rates of population growth, including years that rainfall was considered more plentiful. Despite the rate of water consumption in the service area tripling between the mid-1920s and mid-1950s, there had been no additions to the City municipal water supply during that time. Creegan & D'Angelo would also serve as the engineers for the Santa Cruz County Flood Control and Water Conservation District Advisory Committee, and ultimately, their recommendations to the council to remedy the current water crisis in the City was a dam on Newell Creek (SCS 1953, 1954a, CSC 2007; SCS 1958).

As a surface water storage on Newell Creek became a distinct reality following the recommendations of Creegan and D'Angelo, City Water Department Director, Weston Webber, voiced his support for the project in 1957 claiming that "A dry winter or a spurt in population might well throw Santa Cruz on water rationing in the future...The San Lorenzo River and the coast sources are not only fixed, but too limited…Surface storage is the only way out." (SCS 1957) Creegan & D'Angelo's proposal at Newell Creek competed with multiple other proposals throughout the region. Ultimately, of the five proposed dams, only the Newell Creek Dam would come to fruition. The reasons behind why the remaining dams were not completed are unknown, although frequent discussions about the overall cost of the projects in the SCS suggest budgetary restraints (Brown 2011; 1957a, 1957b, 1957c).

In 1958, the University of California Regents announced that they were considering the Cowell Ranch in the City of Santa Cruz as the site of a future University of California Campus. The City would be required to provide services and facilities for the prospective University community, which early figures suggested was to include around 2,500 students. In anticipation of the Water Revenue Bond Election in November 1958 to approve the bonds necessary to construct the Newell Creek Dam, a new water treatment plant, and pipelines to transport the water, the Santa Cruz Sentinel published an article outlining the impact of the proposed bonds. In reference to the speculative University in the City, the closing paragraph of the article states that "University officials know that the present water supply of Santa Cruz is inadequate, even for normal needs. Failure to correct this situation could end all chance of the selection of Santa Cruz as the University site." (SCS 1961b; SCS 1961a; SCS 1958).

On November 5, 1958, the voters of the City of Santa Cruz approved $5.5 million in water revenue bonds necessary for the City to purchase 2,162 acres of land in the Newell Creek watershed from the San Lorenzo Valley Water District and build a dam on the site. Creegan & D'Angelo designed the earthfill dam. Additional improvements included a pipeline, a treatment plant on Graham Hill Road, and two pumping stations. (SCWD 1986; Brown 2011; SPH Associates Consulting Engineers 2010; SCS 1958).

Construction of Newell Creek Dam

Contractors Williams and Burrows Inc. of Belmont, California, began the construction of the Newell Creek Dam and preparation for the creation of Loch Lomond in 1960. The early stages of planning and execution were made more difficult by the narrow valley, allowing only one road for ingress and egress for equipment and supplies. The construction of the 195-foot-tall earthfill dam began with a "grout curtain" that pushed concrete 100 feet into the bedrock to fill any fissures or imperfections, ensuring a structurally sound

base. The height and width of the dam's crest was first determined by the reinforced concrete ends. The embankment was then built up using successive layers of random fill from the immediate area, compacted with sheepsfoot tampers above and around the 300 feet of impervious material at the core of the embankment. Four construction personnel lost their lives in October 1960 during the layered construction of the embankment. While the men were drilling out soft areas in the rock to be filled with concrete to prevent water seepage, an abutment sheer wall collapsed and a massive avalanche slid down onto them. A brass plaque commemorating these men was commissioned and remains today on the southwest elevation of the Control House (SCS 1960a; SCS 1960b; SCWD 2015).

The Newell Creek Dam was completed and filling steadily with water by 1961; however, the recreation area on the resulting reservoir was yet to be built. Keeping with the Scottish naming tradition started by Scotsman John Burns when he christened the mountain Ben Lomond in the 1850s, the reservoir was dedicated Loch Lomond during two days of festivities on July 27 and 28, 1963 (SCS 1963).

By 1964, the City distributed a notice to bid on the construction of the Loch Lomond Recreation Development. With the help of a $149,000 state grant, the Loch Lomond Recreation Area was completed by the spring of 1965. It included picnic areas, a concessions building, parking areas, two docks, and a boat launch. An all-weather road leading from Lompico to the Recreation Area was a crucial improvement constructed during this phase of the Project. It allowed visitors to experience the new recreation activities available at Loch Lomond, while simultaneously comprehending the realities of water storage and use in the county (SCS 1964).

In January of 1982, a powerful storm caused flooding throughout the Santa Cruz County. It was discovered that a main pipeline from Loch Lomond had burst and was leaking at an alarming rate. Although the damaged section of pipeline was relocated and repaired by the end of the year, it renewed community attention to the 20-year-old dam and the potential for its components to fail under stress (SCS 1982; Cardona and Associates 1982).

In 1984, the Santa Cruz Water Department received $11.7 million dollars through private Certificates of Participation in order to fund upgrades and modernizations to the water infrastructure system throughout the City. A Division of Safety of Dams survey had recently demonstrated that the spillway at Newell Creek Dam did not meet the newest safety criteria for probable maximum flood conditions, so a portion of the funds were allotted toward upgrade to the dam's spillway wall. The upgrades implemented in 1985, included heightening the Newell Creek Dam spillway wall and the installation of a permanent aerator system. The spillway wall helps to protect the dam embankment in the event of an overflow by directing water safely through the spillway channel and away from the earthfill embankment, and heightening the walls ensures that it could withstand damage from a probable maximum flood equal to approximately five times the intensity of the 1982 flood (SCWD 1986; SCS 1984a).

Property Type: Earthen Dams

For thousands of years, people have stored water and altered their natural environment to their benefit. The oldest known dams date back to 6,000 years ago in present-day Jordan, where farmers constructed earthen mounds to capture rainfall. Dams are typically constructed to serve three main purposes: to hold back or store water, to produce energy, and to control flooding. While technological advancements have improved capacity, safety, and reduced failures, the design of dams has not deviated from several successful engineering methods (Billington et al. 2005).

Dams are classified in terms of materials and form. In California, dams are typically one

of several construction methodologies: rockfill, earthen, masonry, and/or concrete. In California, the topography and geology of a region often drives the construction of a dam, resulting in a vernacular design that often does not adhere to one specific method. Earthen dams were a common choice for dams planned and implemented throughout Northern California during the 1930s, 40s, and 50s. The customizable principles of the design suited many terrains in the varied landscape and additionally reduced transportation and materials costs to remote, inaccessible areas by utilizing local soil for fill. North of Santa Cruz County in Santa Clara County, 9 of 10 dams built between 1935 and 1957 to impound water for municipal use are earthfill dams. Both of the dams located south of Santa Cruz in Monterey County are earthfill dams as well (Corns et al. 1988; SCVWD 2018; MCWRA 2018).

Keeping with the predominant trend in the area at the time it was designed, the Newell Creek Dam is a zoned earthen embankment dam that rests on a pervious foundation. Earthen dams have been employed in communities throughout the world for centuries as a method to control and store the flow of waterways. They are the most common variety of dam because their construction exploits local resources for structure and materials. An earthfill or earthen dam is a type of dam comprised of appropriate soils borrowed from either a local area and/or the result of preparatory excavations. These soils are layered and compacted to form an embankment. There are three principle embankment types: homogenous, diaphragm, and zoned. The suitability of one over the other is determined by site-specific factors including geographic setting, geologic substrate, and availability of local fill material. Homogenous embankments consist of one impervious material throughout the whole embankment mound. Diaphragm embankments are comprised of a layers of pervious material(s) with either an impermeable blanket on the upstream side or an impermeable diaphragmatic layer of earth, cement, or concrete. Zoned embankment types have an impervious central core that is flanked by pervious material zones of sand, gravel, rocks, or a combination of several. In order to control the level of reservoirs created by earthen dams, supplemental structures are required to house the outlet(s) and spillway (USDIBR 1987; USACE 2004).

Creegan & D'Angelo Civil Engineers

Patrick Creegan & Elmer D'Angelo established Creegan & D'Angelo Civil Engineers in 1956 in San Jose, California. The company still operates today under the name Creegan + D'Angelo Infrastructure Engineers from their offices in Monterey, California, and Fairfield, California. The foundation of their business is in civil engineering, covering structural engineering for residential and commercial buildings. They also specialize in water management including planning, design, storage, and disposal strategies; land planning; development and management services; and transportation and public works infrastructure planning.

In addition to Newell Creek Dam and Loch Lomand in Santa Cruz, Creegan + D'Angelo has planned and implemented successful water management projects in multiple Monterey Bay Area locations and throughout California. The following projects demonstrate the range of their projects within the field of water management and distribution:

- Round Hill-Douglas County Sewer Improvement Project. Tahoe, California.
- Davenport Sanitation District Wastewater Management System. Davenport, California.
- Aquifer Storage and Recovery. Monterey Peninsula, California.
- Sand City Desalination Water Supply Project. Sand City, California.
- San Benito Water Distribution System. San Benito County, California.
- North San Jose / Alviso Reservoir. San Jose, California.
- Yosemite Sanitary Sewer Replacement. Yosemite National Park, California.

NRHP and CRHR Criteria

NRHP Criterion A: associated with events that have made a significant contribution to the broad patterns of our history.

CRHR Criterion 1: is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

The Newell Creek Dam Complex is directly associated with events that have made a significant contribution to the development history of water infrastructure in the City of Santa Cruz Water Department service area. The Newell Creek Dam is significant under Criterion A/1 for its association with water infrastructure, which was essential to maintaining the municipal water supply during periods of seasonal water shortages and droughts. The availability of water played a critical role in the early planning, development, and sustained growth of the City, including a factor in the choice of Santa Cruz as the site for a University of California Campus. When the Newell Creek Dam was in its elemental planning stages in 1957, it was one of six reservoir projects recommended by the project engineers, Creegan & D'Angelo, for the long-term water supply reliability for the City and Santa Cruz County. However, the Newell Creek Dam was the only such project that was realized. Loch Lomond Reservoir is the resulting impoundment of Newell Creek by the Newell Creek Dam and it is an important supplementary source of drinking water for Santa Cruz City. The period of significance, beginning in 1958 with approval of $5.5 million in water revenue bonds necessary for the City to purchase land to build the Newell Creek Dam site and ends in 1965 when the Loch Loman Recreation Area was completed. In summary, the subject property is directly associated with important events that have made a significant contribution to the development of water infrastructure development in Santa Cruz. These important events include concerns over local water shortages in the late 1950s (as documented in state and local water supply reports) leading up to the passage of the Water Revenue Bond in 1958, which approved funding for construction of the Newell Creek Dam in direct response to concerns over water shortages. Archival research also revealed that water shortages in the late 1950s threatened to make Santa Cruz a less than desirable choice for the location of the next University of California, noting that failure to correct water shortage issues could end all chance of the selection of Santa Cruz as the University site (SCS 1961b; SCS 1961a; SCS 1958). Construction of the Newell Creek Dam gave the City control over the seasonal fluctuations in water availability and became a critical component to the water infrastructure, which supported the sustained growth of the City after World War II. **Therefore, the subject property appears eligible at the local level under NRHP/CRHP Criteria A/1 at the local level of significance.**

NRHP Criterion B: associated with the lives of significant persons in our past.

CRHR Criterion 2: is associated with the lives of persons important in our past.

Archival research on the subject property failed to reveal associations with any persons significant in the history of Santa Cruz, the state, or the nation. The property does not appear to be associated with any person(s) whose contributions demonstrate historic importance at the local, state, or national level. Therefore, the subject property does not appear eligible under NRHP/CRHR Criteria B/2.

NRHP Criterion C: embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

CRHR Criterion 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.

The subject property is a utilitarian, zoned earthfill dam, a common form of dam that is found throughout California, the United States, and the world. It was designed by Creegan & D'Angelo Civil Engineers in 1958 and constructed by William and Burrows Inc. in 1960. Although Creegan & D'Angelo have contributed a large number of designs to the body of engineered municipal water containment projects in California, the creative merit of their designs is not significant enough to have made an impact on the development of the genre as a whole. Contractors William and Burrows Inc. contributed to the field of architecture by erecting structures of various kinds throughout the San Francisco Bay Area, but overall they did not significantly impact the field of dam design or construction techniques. Archival research suggests that the Newell Creek Dam is typical of its construction type for an earthfill dam, and does not embody any distinctive characteristics of a type, period, or method of construction apart from variances dictated by its specific geographical location. There are little inherent artistic or design values associated with the dam or its associated features, and repeated repairs and routine maintenance have replaced original materials, resulting in loss of integrity. For all of the reasons described herein, the subject property does not appear eligible under NRHP/CRHR Criteria C/3.

NRHP Criterion D: have yielded, or may be likely to yield, information important in history or prehistory.

CRHR Criterion 4: has yielded, or may be likely to yield, information important in prehistory or history.

There is no evidence to indicate that the subject property is likely to yield and additional information important to prehistory or history beyond what is already know. The subject property is also not associated with an archaeological site or a known subsurface cultural component. Therefore, the subject property does not appear eligible under NRHP/CRHP Criteria D/4.

County of Santa Cruz Criteria

For the same reasons already discussed in application of NRHP and CRHR criteria, the Newell Creek Dam Complex appears eligible under Criterion 2 of the County of Santa

Cruz criteria, as described in Section 16.42.050(C) of the Title 16 Environment and Resource Protection, Chapter 16.42 Historic Preservation.

1. The resource is associated with a person of local, State or national historical significance;

   As stated in Criterion B/2, archival research did not reveal an association between the Newell Creek Dam and any persons who significantly contributed to the development of the city, state, or nation.

2. The resource is associated with an historic event or thematic activity of local, State or national importance.

   As stated in Criterion A/1, the Newell Creek Dam is associated with events that have made a significant contribution to the development history of water infrastructure in Santa Cruz County, including local water shortages in the late 1950s (as documented in state and local water supply reports) leading up to the passage of the Water Revenue Bond in 1958, which approved funding for construction of the Newell Creek Dam in direct response to concerns over water shortages. Archival research also revealed that water shortages in the late 1950s threatened to make Santa Cruz a less than desirable choice for the location of the next University of California, noting that failure to correct water shortage issues could end all chance of the selection of Santa Cruz as the University site (SCS 1961b; SCS 1961a; SCS 1958). Construction of the Newell Creek Dam gave the City control over the seasonal fluctuations in water availability and became a critical component to the water infrastructure, which supported the sustained growth of the City after World War II. Therefore, it qualifies under County of Santa Cruz Criterion 2.

3. The resource is representative of a distinct architectural style and/or construction method of a particular historic period or way of life, or the resource represents the work of a master builder or architect or possesses high artistic values.

   As discussed in Criterion C/3, the Newell Creek Dam is an archetypical, zoned earthfill dam. Its design does not possess any special aesthetic merit because it was constructed simply and lacks distinctive characteristics beyond those dictated by the surrounding terrain.

   Creegan & D'Angelo Civil Engineers designed the Newell Creek Dam in 1958, 2 years after starting their firm in 1956. Although it is representative of an early Creegan & D'Angelo project, archival research did not reveal that the designers/engineers exercised any degree of influence over their peers within the time period associated with the dam and its features.

4. The resource has yielded, or may likely yield, information important to history.

   As discussed under Criterion D/4, there is no evidence to indicate that the subject property is likely to yield and additional information important to prehistory or history beyond what is already know. The subject property is also

not associated with an archaeological site or a known subsurface cultural component.

Integrity

In accordance with the NRHP guidelines, properties that are eligible for listing in the NRHP must be significant under one or more of the criteria and must have sufficient integrity to convey their significance. These rules apply whether the property is considered for individual listing or as a contributing resource within a historic district. In assessing historic integrity, the NRHP recognizes seven aspects or qualities that, in various combinations, define integrity. In order to retain historic integrity "a property will always possess several, and usually most, of the aspects" (NPS 2002).

The CRHR generally follows the integrity guidelines for the NRHP, but it recognizes that it is possible that historical resources that may not retain sufficient integrity to meet the criteria for listing in the NRHP may still be eligible for listing in the CRHR. A resource that has lost its historic character or appearance may still have sufficient integrity for the CRHR if it maintains the potential to yield significant scientific or historical information or specific data.

The seven aspects of integrity are:

- **Location** – the location where the historic property was constructed or the place where the historic event occurred.
- **Design** – the combination of elements that create the form, plan, space, structure, and style of a property.
- **Setting** – the physical environment of a historic property or the character of the place in which the property played its historic role.
- **Materials** – the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
- **Workmanship** – the physical evidence of crafts of a particular culture or people during any given period in history or prehistory.
- **Feeling** – a property's expression of the aesthetic or historic sense of a particular period of time.
- **Association** – the direct link between an important historic event or person and a historic property.

The subject property was found to retain sufficient integrity to convey significance in the areas of location, design, setting, feeling, and association. The property retains integrity of location, setting, and feeling, as the vicinity surrounding the Newell Creek Dam Complex has retained its rural presence and character. Although the dam and its associated features does not exhibit distinctive artistic characteristics, the integrity of the original design endures as an archetypal earthen embankment dam. The Newell Creek Dam and the resultant Loch Lomond reservoir remains an important source of drinking water storage for the City and therefore maintains its association with the development of water infrastructure in Santa Cruz.

Evaluation Findings

After thorough consideration of NRHP, CRHR, and County evaluation criteria, the Newell

Creek Dam and its associated features appear eligible for the NRHP and CRHR under Criterion A/1 at the local level of significance and eligible for local listing under Santa Cruz County Criterion 2 for its associations with local water development. Therefore, it is considered an historic property under Section 106 of the NHPA and an historical resource under CEQA.

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plunge pool crossing, the existing outlet and seepage channel, the control house, Newell Creek Road, haul and access routes, and staging areas.

Historic property identification efforts included a records search, a pedestrian archaeological survey, and an architectural survey of the APE between February and September 2018 by the Applicant's consultant. These efforts did not identify any previously recorded cultural resources within the APE; however, the architectural survey identified and recorded the Newell Creek Dam Complex and its associated features within the APE. No archaeological resources were identified within the APE. A Dudek architectural historian evaluated the Newell Creek Dam Complex, recommending it eligible for listing on the National Register of Historic Places (NRHP) under Criterion A, at the local level of significance. The COE has agreed with this recommendation.

The COE contacted the Native American Heritage Commission (NAHC) and received a list of Native American contacts for the project location. The COE contacted all of the listed contacts by letter on April 8, 2019. No responses have been received to date.

The COE has indicated that the proposed undertaking would not significantly alter the character defining features of the Newell Creek Dam Complex and would not cause an adverse effect to the resource. Therefore, the COE has proposed a finding of *no adverse effect* for this undertaking, pursuant to 36 CFR 800.5(b). The COE is requested SHPO review and comment on their determination of eligibility and proposed finding of effect. After reviewing the submitted materials, the following comments are offered:

- I agree that the Newell Creek Dam Complex is eligible for listing on the NRHP under Criterion A at the local level of significance.
- Pursuant to 36 CFR 800.5(c)(1), **I do not object** to a finding of *no adverse effect* for this undertaking.

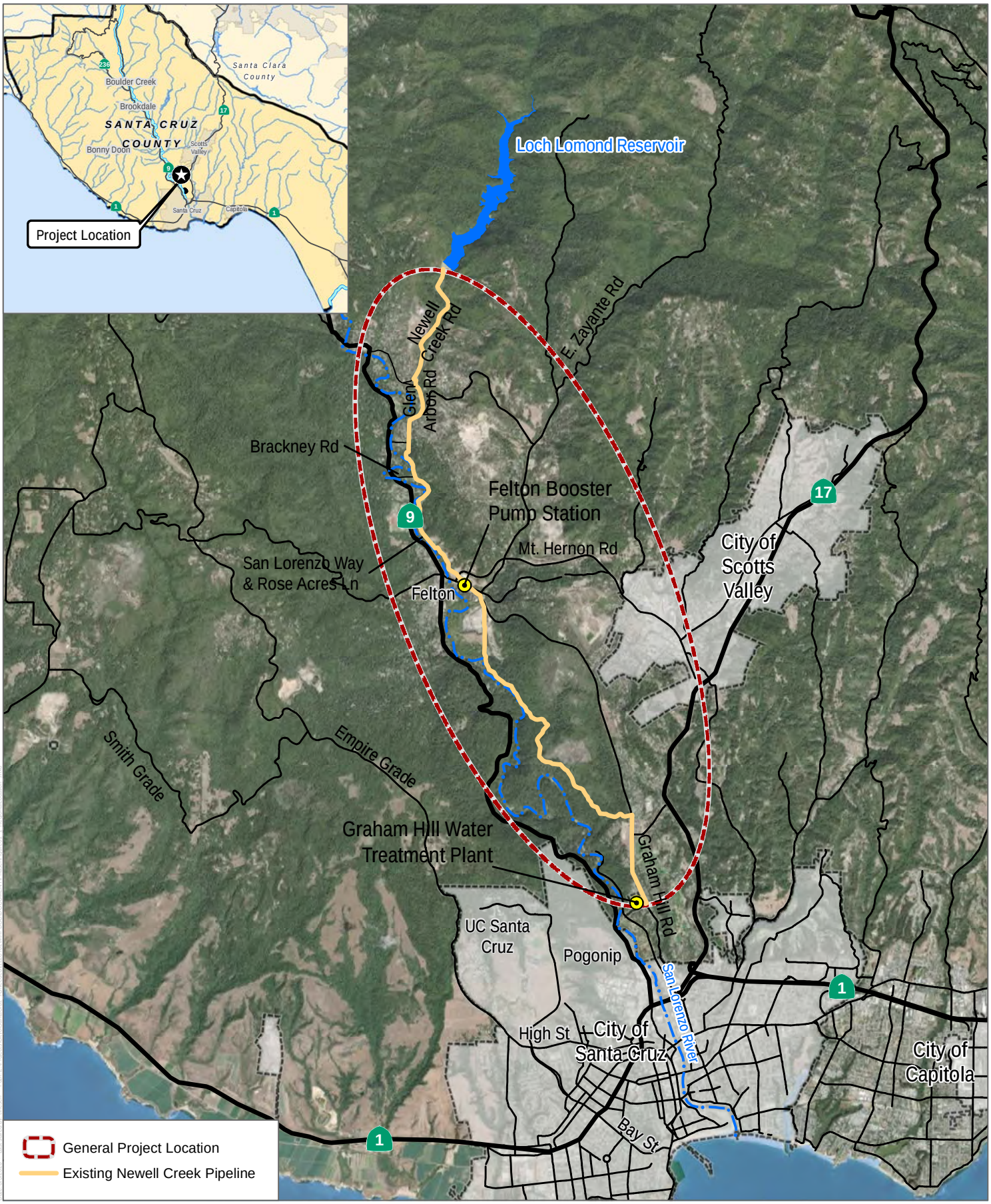
If you have any questions, please contact Jessica Tudor Elliott at (916) 445-7016 or jessica.tudor@parks.ca.gov, or Ed Carroll at (916)445-7006 or ed.carroll@parks.ca.gov.

Sincerely,

Julianne Polanco
State Historic Preservation Officer

Appendix B

Project Maps, Project Plans, and Area of Potential Effect Maps



SOURCE: ESRI 2020, City of Santa Cruz 2020

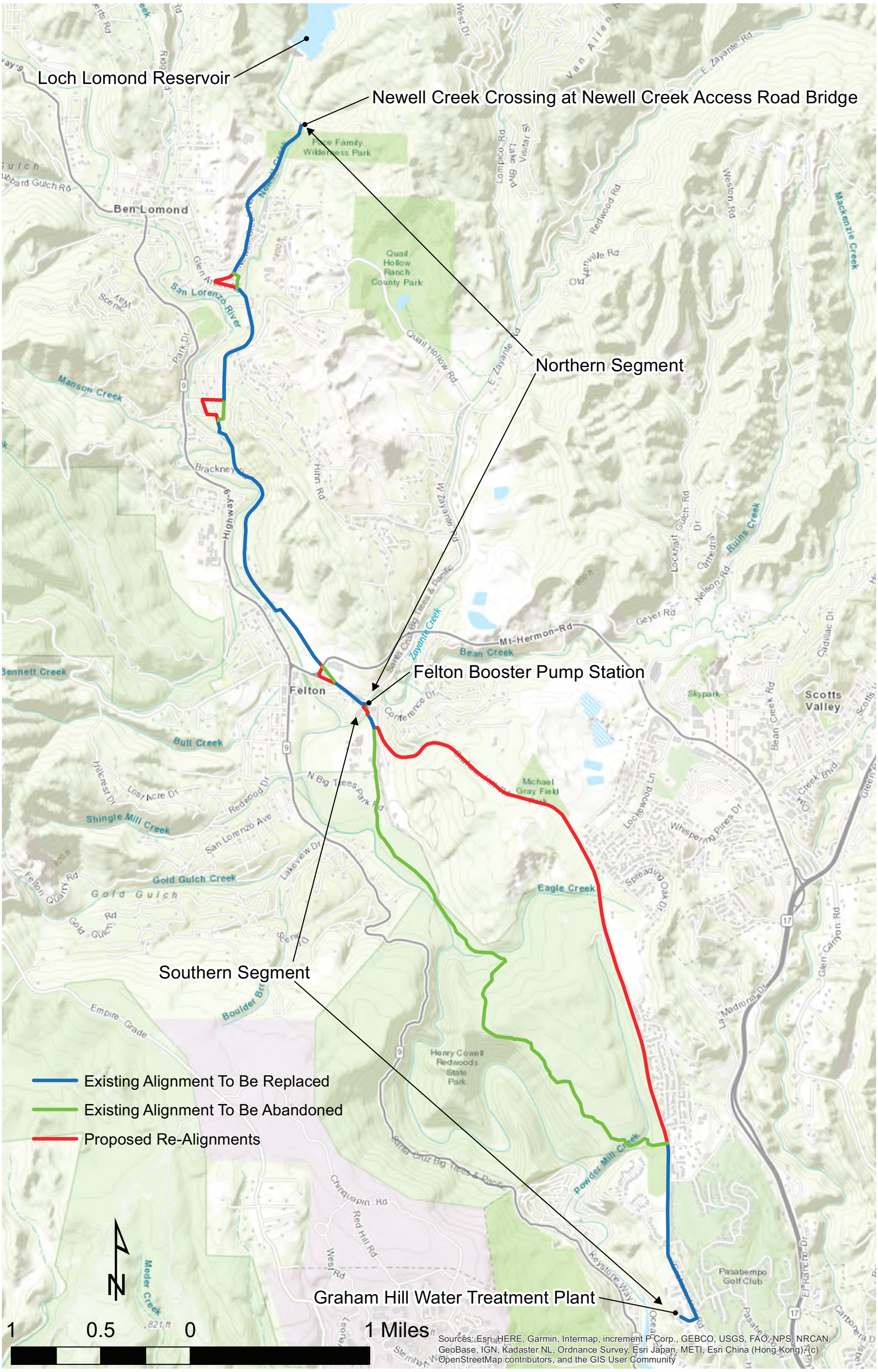
DUDEK

0 3,750 7,500 Feet

FIGURE 1

Project Location

Newell Creek Pipeline Improvement Project



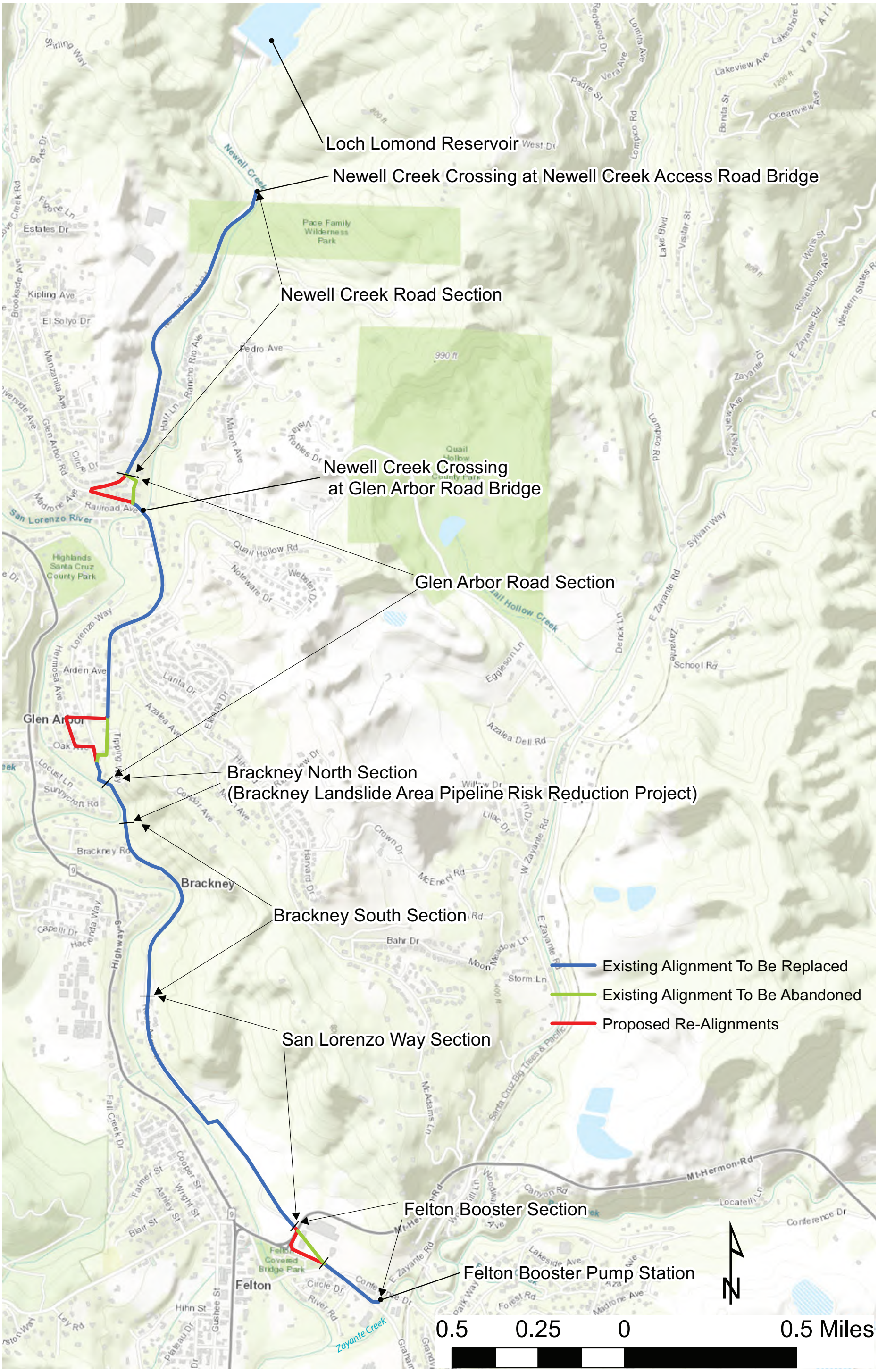
SOURCE: City of Santa Cruz Water Department 2020

FIGURE 2

Proposed Newell Creek Pipeline Improvement Project Overview

Newell Creek Pipeline Improvement Project

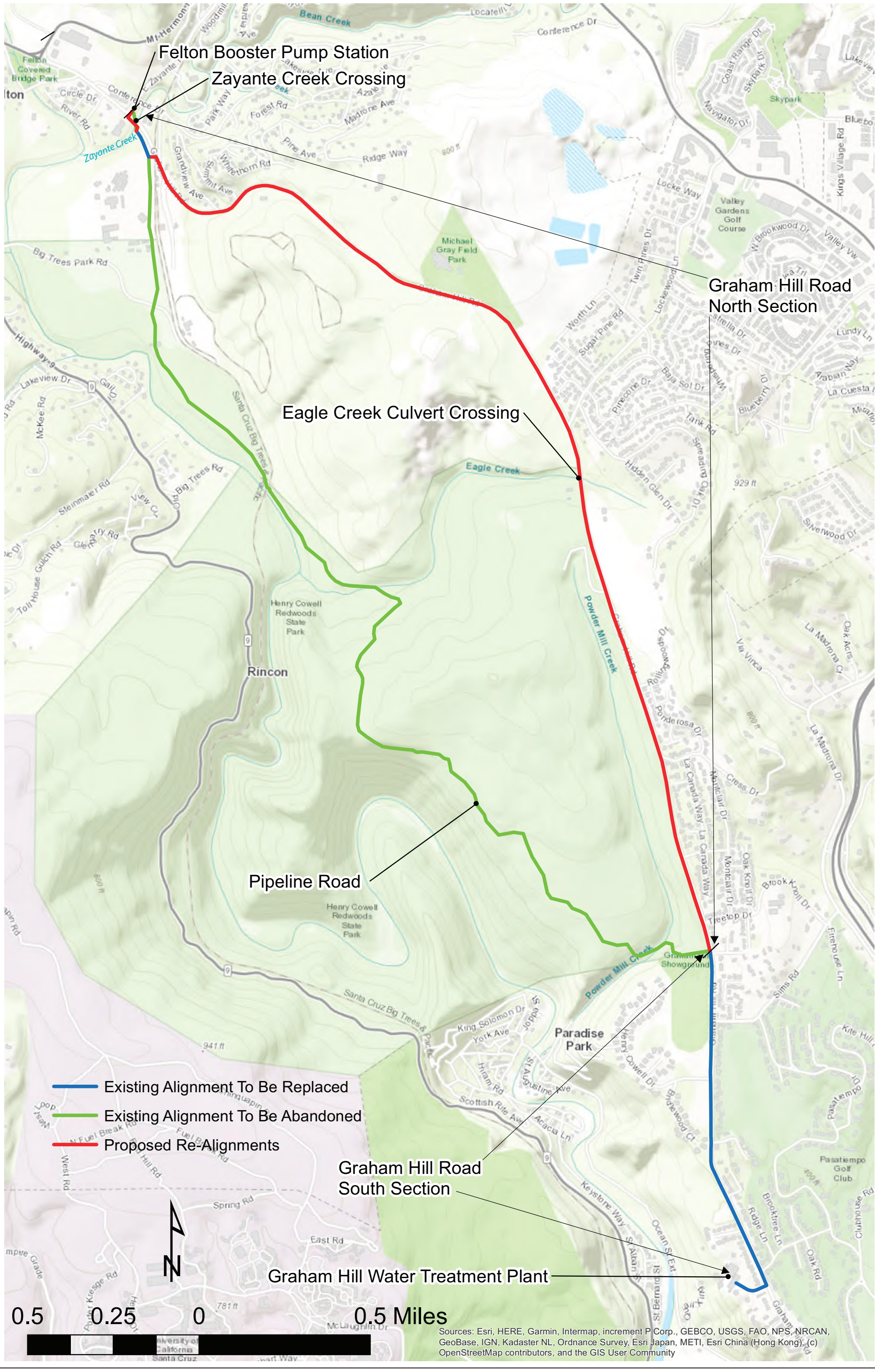
DUDEK



SOURCE: City of Santa Cruz Water Department 2020

FIGURE 3

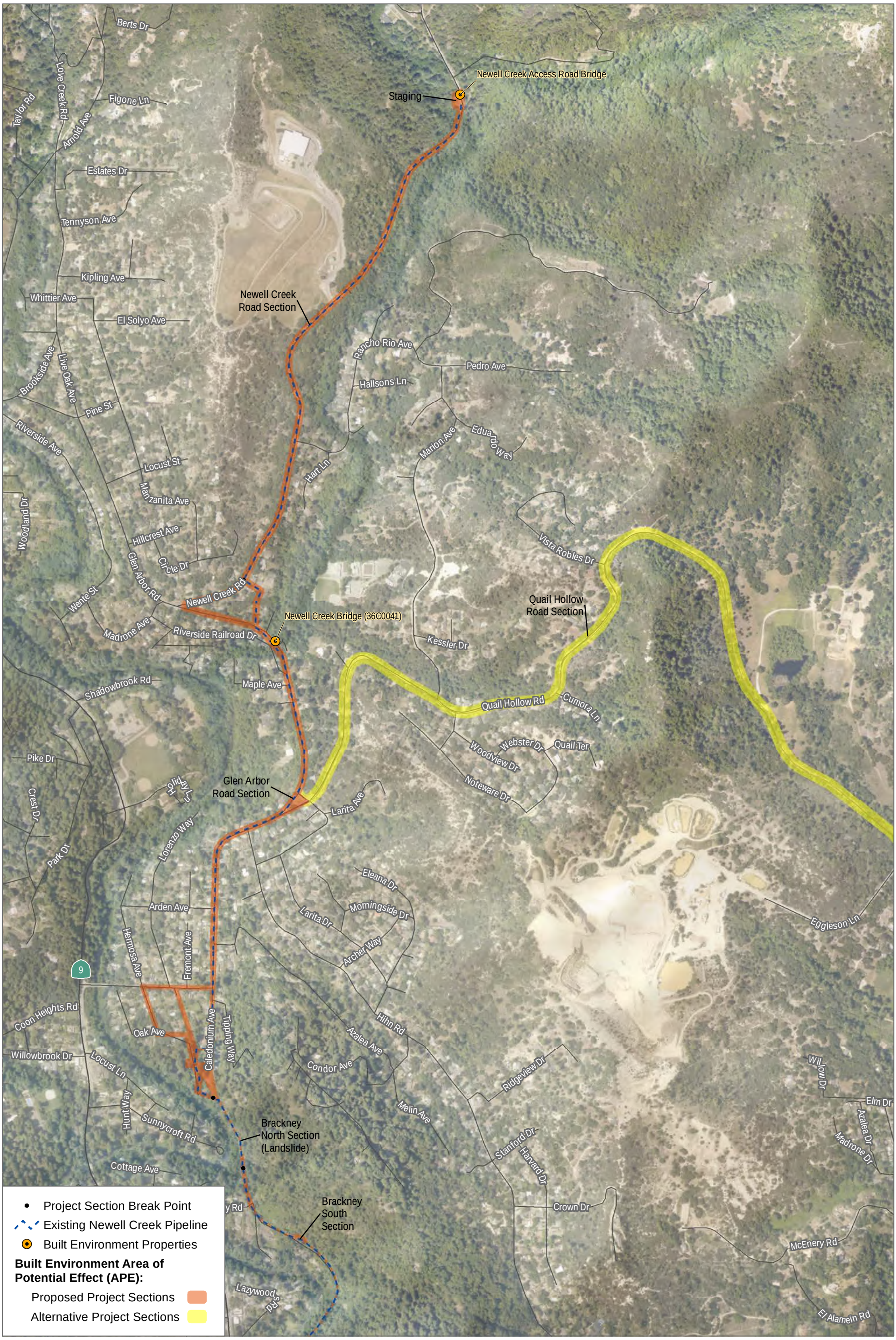
Proposed Newell Creek Pipeline Improvement Project Northern Segment



SOURCE: City of Santa Cruz Water Department 2020

FIGURE 4

Proposed Newell Creek Pipeline Improvement Project Southern Segment



SOURCE: ESRI 2021, HDR 2019 County of Santa Cruz 2020, City of Santa Cruz Water Department 2020

FIGURE 3-1

Built Environment Area of Potential Effect: Newell Creek Road, Glen Arbor Road, Brackney North, and Alternative Sections

Newell Creek Pipeline Improvement Project

DUDEK

0 400 800 Feet



SOURCE: ESRI 2021, HDR 2019 County of Santa Cruz 2020, City of Santa Cruz Water Department 2020

FIGURE 3-2

Built Environment Area of Potential Effect: Brackney North, Brackney South, San Lorenzo Way, Felton Booster and Alternative Sections

DUDEK

0 400 800 Feet

Newell Creek Pipeline Improvement Project



SOURCE: ESRI 2021, HDR 2019 County of Santa Cruz 2020, City of Santa Cruz Water Department 2020

DUDEK

0 400 800 Feet

FIGURE 3-3

Built Environment Area of Potential Effect: Graham Hill North, Pipeline Road, and Alternative Sections

Newell Creek Pipeline Improvement Project



SOURCE: ESRI 2021, HDR 2019 County of Santa Cruz 2020, City of Santa Cruz Water Department 2020

DUDEK

0 400 800 Feet

FIGURE 3-4

Built Environment Area of Potential Effect: Graham Hill North and Alternative Sections

Newell Creek Pipeline Improvement Project



SOURCE: ESRI 2021, HDR 2019 County of Santa Cruz 2020, City of Santa Cruz Water Department 2020

DUDEK

0 400 800 Feet

FIGURE 3-5

Built Environment Area of Potential Effect: Graham Hill North, Pipeline Road, Graham Hill South, and Alternative Sections

Newell Creek Pipeline Improvement Project

Appendix C

Preparer's Qualifications

Kathryn Haley, MA

Senior Architectural Historian

Kathryn Haley is a senior architectural historian with over 17 years of professional experience in historic/cultural resource management. Ms. Haley has worked on a wide variety of projects involving historic research, field inventory, and site assessment conducted for compliance with Section 106, NEPA, and CEQA. Ms. Haley specializes in California Register of Historical Resources (CRHR), the National Register of Historic Places (NRHP), evaluations of built environment resources, including water management structures (levees, canals, dams, ditches), buildings (residential, industrial, and commercial), and linear resources (railroad alignments, roads, and bridges). She specializes in managing large-scale surveys of built environment resources including historic district evaluations. She meets the Secretary of the Interior's Professional Qualification Standards for historian and architectural historian. Moreover, Ms. Haley has served as project manager, coordinator, historian, and researcher for a wide variety of projects. With regard to experience with water related projects, she has prepared numerous Cultural Resources Inventory and Evaluation Reports in Section 106 compliance and through the permitting process with the U.S. Army Corps of Engineers (USACE).

Education

California State University, Sacramento
MA, Public History, 2004

California State University, Sacramento
BA, History, 2001

Professional Affiliations

California Council for the Promotion of History (former Treasurer)

California Preservation Foundation

Dudek Project Experience

Municipal Waterways Maintenance Project CEQA Compliance and USACE permitting- City of San Diego, San Diego, California. January 2019 - Ongoing.
Dudek developed the Municipal Waterways Maintenance Plan (MWMP) in close coordination with the City of San Diego and prepared a program EIR for the City's on-going stormwater facility maintenance program. The Municipal Waterways Maintenance Plan details the planned maintenance activities, specific facility maintenance locations, biological compensatory mitigation sites, agency permitting procedures, and includes site-specific facility maintenance plans and/or technical summaries for stormwater conveyance channels, ditches, structures, and basins throughout eight watersheds within the City's municipal boundaries. Dudek prepared a program EIR for the maintenance program, including cultural resources as one of the associated technical studies. Ms. Haley provided senior level guidance on built environment resources for the project and QA/QC on the technical documentation.

Laguna Creek Diversion Retrofit Project, CEQA Compliance and U.S. Army Corps of Engineers (USACE) permitting – City of Santa Cruz, Bonny Doon, California. June 2020 – Ongoing
As lead architectural historian, Ms. Haley co-authored the Cultural Resources Inventory, Evaluation and Finding of Effect Report for the Laguna Creek Diversion Retrofit Project. The purpose of the project is to retrofit the existing 1890 Laguna Creek Diversion Facility in Bonny Doon, California with a new intake and sediment control system. Ms. Haley co-authored the historical significance evaluation of the Laguna Creek Diversion Facility and is associated components. The significance evaluation determined that the Laguna Creek Dam appears individually eligible as a historic resource/property under NRHP/CRHR Criterion A/1, and Santa Cruz County Criterion 2 as a well-preserved masonry water management structure dating to 1890. It is a physical example of pioneering water management infrastructure in California and is significant for its association with early advances in water management in California, specifically through creation of the City of Santa Cruz's first municipal water distribution system. The project effects assessment recommended that the project would have a less than significant impact on historical resources (CEQA)/no adverse effect on historic properties.

Santa Cruz Water Rights Project CEQA Compliance – City of Santa Cruz, Santa Cruz County, California. July 2020 – Ongoing
As lead architectural historian, Ms. Haley co-authored the Cultural Resources Inventory and Evaluation Report for the Santa Cruz Water Rights Project. The purpose of the proposed project which includes 11 proposed undertakings related to water rights and infrastructure improvements for five water districts in 11 non-contiguous locations in Santa Cruz County, California. As the project includes both project level and programmatic level components, the City requested the document comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966 and the California Environmental Quality Act (CEQA) as federal permits may be needed and/or federal funding may be used for some of the undertakings in the future. Ms. Haley proved QA/QC on the historical significance evaluations of the two historic era properties (over 45 years of age) identified within the APE. Both properties were found not eligible for designation under NRHP, CRHR and local designation criteria. Ms. Haley also wrote the project and program-level impact analysis in the CEQA EIR cultural resources section for built environment resources.

Santa Cruz Wharf Maintenance Project, CEQA Compliance and USACE permitting- City of Santa Cruz, Santa Cruz, California. January 2020.
The purpose of this project is to replace and/or repair storm-damaged piles supporting the Santa Cruz Municipal Wharf in Santa Cruz, California. As lead architectural historian, Ms. Haley provided QA/QC and prepared the finding of effect analysis for the cultural resources technical report for Santa Cruz Wharf Maintenance Project. Ms. Haley assisted in preparing the significance evaluation that recommended the Wharf as eligible under NRHP Criterion A for its continued associations with the industrial development, transportation, commerce, and recreation development of Santa Cruz and under C as a distinctive engineering structure known to be the longest wooden pier structure located along the United States Coast of the Pacific Ocean. Ms. Haley prepared a detailed effects assessment determined that the proposed Wharf Maintenance project would have a less than significant impact on historical resources (CEQA)/no adverse effect on historic properties (Section 106). No mitigation or management recommendations were necessary to support the no adverse effect finding.

Previous Related Project Experience

Feather River Levee Project CEQA/NEPA Compliance—Sutter Butte Flood Control Agency, Butte and Sutter Counties, California (2012 to 2016). The purpose of this project was to assist Sutter Butte Flood Control Agency (SBFCA) through the Section 106 compliance and permitting process with the USACE in order to help facilitate construction improvements along a 40-mile segment of the Feather River Levee in Sutter and Butte Counties. Ms. Haley led the effort to record, evaluate, and document historic built environment resource located in the project area of potential effect (APE) in consultation with the USACE, and the SHPO in compliance with the Programmatic Agreement (PA) for this specific project. Ms. Haley worked extensively with the USACE in the process of documenting the historic era built environment resources located in the APE as well as preparing FOE analysis for significant built environment resources. She also helped to establish efficient and appropriate mitigation measures for properties adversely affected by the project.

Southport Early Implementation Project Environmental Interim Preliminary Planning—West Sacramento Flood Control Agency/HDR Engineering, Yolo County, California (2014 to 2016). Ms. Haley served as lead architectural historian for the Southport Levee project in the City of West Sacramento. Conducted an intensive-level architectural/built environment survey of the project area. Prepared an inventory and evaluation report of resources identified as requiring evaluation under NRHP Criteria. In consultation with USACE, the SHPO, assisted in the preparation of a programmatic agreement and historic properties treatment plan to address cultural resources issues that may arise during project implementation. Cultural work was prepared according to guidelines set forth in the PA for compliance with Section 106.

Knights Landing Outfall Gate Project, Cultural Resources Inventory and Evaluation Report—Reclamation District 108, Yolo County, California (2015). Ms. Haley served as lead architectural historian for the Knights Landing Outfall Gate Project along the Sacramento River near the community of Knights Landing in Yolo County. Conducted an intensive-level architectural/built environment survey of the project area. Prepared an inventory and evaluation report of resources identified as requiring evaluation under NRHP and CRHR Criteria. All work was completed in consultation with USACE, BOR, and the SHPO.

Fallin Elizabeth Steffen, MPS

Architectural Historian

Fallin Steffen is an Architectural Historian with 5 years' experience in historic preservation, architectural conservation, and cultural resource management in the Monterey Bay Area and northern California. Ms. Steffen's professional experience encompasses a variety of projects for local agencies, private developers, and homeowners in both highly urbanized and rural areas, including reconnaissance- and intensive-level surveys, preparation of appropriate historic contexts, and historical significance evaluations in consideration of the NRHP, CRHR, and local designation criteria. Additionally, Ms. Steffen was appointed as a Commissioner to the Santa Cruz City Historic Preservation Commission assisting City Staff with design review and conformance with the Secretary of the Interior Standards for proposed residential, commercial and municipal projects involving historic properties.

Education

Tulane University, New Orleans, LA
Masters of Preservation Studies, 2015

University of California, Santa Cruz, CA
B.A. History of Art & Visual Culture, 2010

Professional Affiliations

California Preservation Foundation

Ms. Steffen meets the Secretary of the Interior's Professional Qualification Standards for Architectural History. She is experienced with interdisciplinary projects spanning private and public development, transportation, and water infrastructure, and maintains experience forming educational sessions about the identification of and best practices for the preservation of historic resources.

Previous Related Project Experience

Salsipuedes Creek Levee Culvert Replacement Project, CEQA Compliance and U.S. Army Corps of Engineers (USACE) permitting, County of Santa Cruz, California. August 2020.
The Santa Cruz County Department of Public Works retained Dudek to complete a cultural resources inventory and evaluation report for a project to replace two aging culverts in the right bank of the Salsipuedes Creek Levee in an unincorporated area northwest of Watsonville, California. The report was prepared in compliance with Section 106 and in support of the permitting process with the USACE. Ms. Steffen co-authored the built environment components of the cultural report including the historical significance evaluation of the Salsipuedes Creek Levee segment identified within the APE. The property was found not eligible for designation under NRHP, CRHR and local designation criteria.

Santa Cruz Water Rights Project CEQA Compliance – City of Santa Cruz, Santa Cruz County, California. July 2020 – Ongoing
As architectural historian, Ms. Steffen co-authored the Cultural Resources Inventory and Evaluation Report for the Santa Cruz Water Rights Project. The purpose of the proposed project which includes 11 proposed undertakings related to water inter rights and infrastructure improvements for five water districts in 11 discontiguous locations in Santa Cruz County, California. As the project includes both project level and programmatic level components, the City requested the document comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966 and the California Environmental Quality Act (CEQA) as federal permits may be needed and/or federal funding may be used for some of the undertakings in the future. Ms. Steffen co-authored historical significance evaluations of the two historic era properties (over 45 years of age) identified within the APE. Both properties were found not eligible for designation under NRHP, CRHR and local designation criteria.

Laguna Creek Diversion Retrofit Project, CEQA Compliance and U.S. Army Corps of Engineers (USACE) permitting – City of Santa Cruz, Bonny Doon, California. June 2020 – Ongoing
As architectural historian, Ms. Steffen conducted the fieldwork and co-authored the Cultural Resources Inventory, Evaluation and Finding of Effect Report for the Laguna Creek Diversion Retrofit Project. The purpose of the project is to

retrofit the existing 1890 Laguna Creek Diversion Facility in Bonny Doon, California with a new intake and sediment control system. Ms. Steffen co-authored the historical significance evaluation of the Laguna Creek Diversion Facility and is associated components. The significance evaluation determined that the Laguna Creek Dam appears individually eligible as a historic resource/property under NRHP/CRHR Criterion A/1, and Santa Cruz County Criterion 2 as a well-preserved masonry water management structure dating to 1890. It is a physical example of pioneering water management infrastructure in California and is significant for its association with early advances in water management in California, specifically through creation of the City of Santa Cruz's first municipal water distribution system. All other associated facility buildings and structures were found not eligible under all NRHP, CRHR, and local designation criteria, and the project effects assessment recommends that the project would have a less than significant impact on historical resources (CEQA)/no adverse effect on historic properties.

Santa Cruz Wharf Maintenance Project CEQA Compliance and USACE permitting- City of Santa Cruz, Santa Cruz, California. January 2020.
The purpose of this project is to replace and/or repair storm-damaged piles supporting the Santa Cruz Municipal Wharf in Santa Cruz, California. As lead architectural historian, Ms. Steffen conducted fieldwork and co-authored the Evaluation and Finding of Effect Report for the Santa Cruz Wharf Maintenance Project. The report was prepared in compliance with Section 106 and in support of the permitting process with the USACE. Although the Wharf had previously evaluated under CRHR and local Criteria by another historian in recent years, no NRHP Criteria evaluation existed. Ms. Steffen co-authored all documentation related to Wharf including the significance evaluation that recommended the Wharf as eligible under NRHP Criterion A for its continued associations with the industrial development, transportation, commerce, and recreation development of Santa Cruz and under C as a distinctive engineering structure known to be the longest wooden pier structure located along the United States Coast of the Pacific Ocean. Additionally, a detailed effects assessment determined that the proposed Wharf Maintenance project would have a less than significant impact on historical resources (CEQA)/no adverse effect on historic properties (Section 106). No mitigation or management recommendations were necessary to support the no adverse effect finding.

Newell Creek Road Access Bridge Rehabilitation Memorandum Report, City of Santa Cruz, California. February 2019.
Dudek was retained by the City of Santa Cruz Water Department to review the proposed Newell Creek Access Road Bridge Rehabilitation project for potential impacts on historical resources during the course of repairs to the bridge's piers. The bridge was identified as a contributor to the Newell Creek Dam district as part of the 2018 historical resources evaluation report of the Newell Creek Dam complex. Ms. Steffen served as architectural historian for the project, conducting the intensive pedestrian survey of the project site and authoring the memorandum report ensuring that the project conformed to the Secretary of the Interior's Standards for the Treatment of Historic Properties.

Historic Context Statement for Reservoirs, City of San Diego Public Utilities Department, California. December 2018.
Ms. Steffen served as architectural historian and co-author of the historic context statement for El Captain Dam and reservoir. Dudek is also preparing detailed impacts assessments for proposed modification to dams, as required by DSOD. The project involves evaluation of at least 10 dams for historical significance in consideration of NRHP, CRHR, and City designation criteria and integrity requirements, and requires extensive archival research and pedestrian survey. Upon completion of the project, the City will have a streamlined document for the management of their historic dam and reservoir infrastructure.

Newel Creek Dam Inlet/Outlet Replacement Project, City of Santa Cruz, California. October 2018.
Ms. Steffen served as architectural historian for the project and co-authored the historical resources evaluation report for the Newell Creek Dam Inlet/Outlet Replacement Project. The City of Santa Cruz retained Dudek to complete the report in support of the proposed project to replace the existing inlet/outlet works on the 1960 Newell Creek Dam in Santa Cruz County, California. The report included a California Historical Resources Information System (CHRIS) records search addressing the proposed APE plus a 0.50-mile radius, a pedestrian survey of the project site for built-environment resources, a historical significance evaluation of the seven historic era structures identified within the APE, and an assessment of project-related impacts to historical resources in conformance with the California Environmental Quality Act (CEQA) and project effects to historic properties in conformance with Section 106 of the NHPA. The significance evaluation determined that the Newell Creek Dam complex appears eligible as a historic resource/property under NRHP/CRHR Criterion A/1, and Santa Cruz County Criterion 2 for its association with local water management in California. The project effects assessment concluded that the project would have a less than significant impact on historical resources/no adverse effect on historic properties.

Appendix D

Confidential Records Search Results

Appendix E

Historic Advocacy Outreach

725 FRONT STREET, SUITE 400
SANTA CRUZ, CALIFORNIA 95060
T 831.600.1400 F 831.600.1401

April 16, 2021

Ashley Holmes
Santa Cruz Museum of Art and History
705 Front Street
Santa Cruz, CA 95060

Subject: Newell Creek Pipeline Improvement Project

Dear Ms. Holmes:

Dudek has been retained by the City of Santa Cruz Water Department to conduct a cultural resources study for the Newell Creek Pipeline Improvement Project (Proposed Project). The Newell Creek Pipeline (NCP) conveys untreated water from the City's Felton Diversion to Loch Lomond Reservoir for storage and also conveys impounded water from Loch Lomond to the to the Graham Hill Water Treatment Plant (GHWTP) by way of the Felton Booster Pump Station (FBPS) located at the intersection of Graham Hill Road and East Zayante Road. The NCP is located in the Santa Cruz Mountains in the unincorporated area of Santa Cruz County, except for the portion of the NCP that extends onto the GHWTP property, which is located within the City of Santa Cruz (City), but is surrounded by unincorporated lands (see Figure 1 enclosed). The Santa Cruz Water Department is proposing to address the identified deficiencies in existing pipeline conditions, as well as provide improved access for maintenance and repair. The Proposed Project consists of replacement of 8.75 miles of the existing NCP with a new 24- inch polyvinyl chloride (PVC), ductile iron or high-density polyethylene (HDPE) pipeline. The pipeline generally would be installed within existing road pavement, road right-of-way (ROW), and/or existing SCWD easements. The Proposed Project would improve long-term reliability of the SCWD water supply infrastructure between Loch Lomond Reservoir and the GHWTP such that it can continue to function as an integral part of the City's overall water supply system.

As part of our study, we are consulting all regional historical organizations to determine if there are any known historic or cultural resources that may be affected by the Proposed Project. Your efforts in this process will provide invaluable information for the proper identification and treatment of such resources. If you have any information regarding known cultural resources in the Proposed Project area, please feel free to contact me via phone or email (listed below), or you can contact Doug Valby, Associate Civil Engineer with the City of Santa Cruz Water Department, by phone at (831) 212-5501 or by email at dvalby@cityofsantacruz.com. All comments, emails, or letters received will be included in the reports generated by this study. Thank you for your time regarding our request.

Sincerely,



Fallin Steffen, MPS
Architectural Historian

P: 831.400.8882
E: fsteffen@dudek.com

Enclosure

Figure 1. Proposed Newell Creek Pipeline Improvement Project Overview

725 FRONT STREET, SUITE 400
SANTA CRUZ, CALIFORNIA 95060
T 831.600.1400 F 831.600.1401

April 16, 2021

Felicia Van Stolk
Santa Cruz Museum of Natural History
1305 E Cliff Drive
Santa Cruz, CA 95062

Subject: Newell Creek Pipeline Improvement Project

Dear Ms. Van Stolk:

Dudek has been retained by the City of Santa Cruz Water Department to conduct a cultural resources study for the Newell Creek Pipeline Improvement Project (Proposed Project). The Newell Creek Pipeline (NCP) conveys untreated water from the City's Felton Diversion to Loch Lomond Reservoir for storage and also conveys impounded water from Loch Lomond to the to the Graham Hill Water Treatment Plant (GHWTP) by way of the Felton Booster Pump Station (FBPS) located at the intersection of Graham Hill Road and East Zayante Road. The NCP is located in the Santa Cruz Mountains in the unincorporated area of Santa Cruz County, except for the portion of the NCP that extends onto the GHWTP property, which is located within the City of Santa Cruz (City), but is surrounded by unincorporated lands (see Figure 1 enclosed). The Santa Cruz Water Department is proposing to address the identified deficiencies in existing pipeline conditions, as well as provide improved access for maintenance and repair. The Proposed Project consists of replacement of 8.75 miles of the existing NCP with a new 24- inch polyvinyl chloride (PVC), ductile iron or high-density polyethylene (HDPE) pipeline. The pipeline generally would be installed within existing road pavement, road right-of-way (ROW), and/or existing SCWD easements. The Proposed Project would improve long-term reliability of the SCWD water supply infrastructure between Loch Lomond Reservoir and the GHWTP such that it can continue to function as an integral part of the City's overall water supply system.

As part of our study, we are consulting all regional historical organizations to determine if there are any known historic or cultural resources that may be affected by the Proposed Project. Your efforts in this process will provide invaluable information for the proper identification and treatment of such resources. If you have any information regarding known cultural resources in the Proposed Project area, please feel free to contact me via phone or email (listed below), or you can contact Doug Valby, Associate Civil Engineer with the City of Santa Cruz Water Department, by phone at (831) 212-5501 or by email at dvalby@cityofsantacruz.com. All comments, emails, or letters received will be included in the reports generated by this study. Thank you for your time regarding our request.

Sincerely,



Fallin Steffen, MPS
Architectural Historian

P: 831.400.8882
E: fsteffen@dudek.com

Enclosure

Figure 1. Proposed Newell Creek Pipeline Improvement Project Overview

725 FRONT STREET, SUITE 400
SANTA CRUZ, CALIFORNIA 95060
T 831.600.1400 F 831.600.1401

April 16, 2021

San Lorenzo Valley Museum
12547 CA-9
Boulder Creek, CA 95006

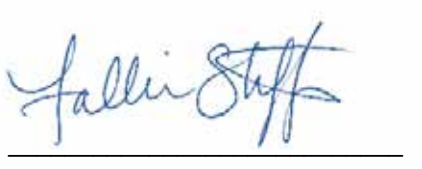
Subject: Newell Creek Pipeline Improvement Project

To Whom it May Concern:

Dudek has been retained by the City of Santa Cruz Water Department to conduct a cultural resources study for the Newell Creek Pipeline Improvement Project (Proposed Project). The Newell Creek Pipeline (NCP) conveys untreated water from the City's Felton Diversion to Loch Lomond Reservoir for storage and also conveys impounded water from Loch Lomond to the to the Graham Hill Water Treatment Plant (GHWTP) by way of the Felton Booster Pump Station (FBPS) located at the intersection of Graham Hill Road and East Zayante Road. The NCP is located in the Santa Cruz Mountains in the unincorporated area of Santa Cruz County, except for the portion of the NCP that extends onto the GHWTP property, which is located within the City of Santa Cruz (City), but is surrounded by unincorporated lands (see Figure 1 enclosed). The Santa Cruz Water Department is proposing to address the identified deficiencies in existing pipeline conditions, as well as provide improved access for maintenance and repair. The Proposed Project consists of replacement of 8.75 miles of the existing NCP with a new 24- inch polyvinyl chloride (PVC), ductile iron or high-density polyethylene (HDPE) pipeline. The pipeline generally would be installed within existing road pavement, road right-of-way (ROW), and/or existing SCWD easements. The Proposed Project would improve long-term reliability of the SCWD water supply infrastructure between Loch Lomond Reservoir and the GHWTP such that it can continue to function as an integral part of the City's overall water supply system.

As part of our study, we are consulting all regional historical organizations to determine if there are any known historic or cultural resources that may be affected by the Proposed Project. Your efforts in this process will provide invaluable information for the proper identification and treatment of such resources. If you have any information regarding known cultural resources in the Proposed Project area, please feel free to contact me via phone or email (listed below), or you can contact Doug Valby, Associate Civil Engineer with the City of Santa Cruz Water Department, by phone at (831) 212-5501 or by email at dvalby@cityofsantacruz.com. All comments, emails, or letters received will be included in the reports generated by this study. Thank you for your time regarding our request.

Sincerely,



Fallin Steffen, MPS
Architectural Historian

P: 831.400.8882
E: fsteffen@dudek.com

Enclosure

Figure 1. Proposed Newell Creek Pipeline Improvement Project Overview

725 FRONT STREET, SUITE 400
SANTA CRUZ, CALIFORNIA 95060
T 831.600.1400 F 831.600.1401

April 16, 2021

University of California, Santa Cruz
McHenry Library Special Collections and Archives
1156 High Street
Santa Cruz, CA 95064

Subject: Newell Creek Pipeline Improvement Project

To Whom it May Concern:

Dudek has been retained by the City of Santa Cruz Water Department to conduct a cultural resources study for the Newell Creek Pipeline Improvement Project (Proposed Project). The Newell Creek Pipeline (NCP) conveys untreated water from the City's Felton Diversion to Loch Lomond Reservoir for storage and also conveys impounded water from Loch Lomond to the to the Graham Hill Water Treatment Plant (GHWTP) by way of the Felton Booster Pump Station (FBPS) located at the intersection of Graham Hill Road and East Zayante Road. The NCP is located in the Santa Cruz Mountains in the unincorporated area of Santa Cruz County, except for the portion of the NCP that extends onto the GHWTP property, which is located within the City of Santa Cruz (City), but is surrounded by unincorporated lands (see Figure 1 enclosed). The Santa Cruz Water Department is proposing to address the identified deficiencies in existing pipeline conditions, as well as provide improved access for maintenance and repair. The Proposed Project consists of replacement of 8.75 miles of the existing NCP with a new 24- inch polyvinyl chloride (PVC), ductile iron or high-density polyethylene (HDPE) pipeline. The pipeline generally would be installed within existing road pavement, road right-of-way (ROW), and/or existing SCWD easements. The Proposed Project would improve long-term reliability of the SCWD water supply infrastructure between Loch Lomond Reservoir and the GHWTP such that it can continue to function as an integral part of the City's overall water supply system.

As part of our study, we are consulting all regional historical organizations to determine if there are any known historic or cultural resources that may be affected by the Proposed Project. Your efforts in this process will provide invaluable information for the proper identification and treatment of such resources. If you have any information regarding known cultural resources in the Proposed Project area, please feel free to contact me via phone or email (listed below), or you can contact Doug Valby, Associate Civil Engineer with the City of Santa Cruz Water Department, by phone at (831) 212-5501 or by email at dvalby@cityofsantacruz.com. All comments, emails, or letters received will be included in the reports generated by this study. Thank you for your time regarding our request.

Sincerely,

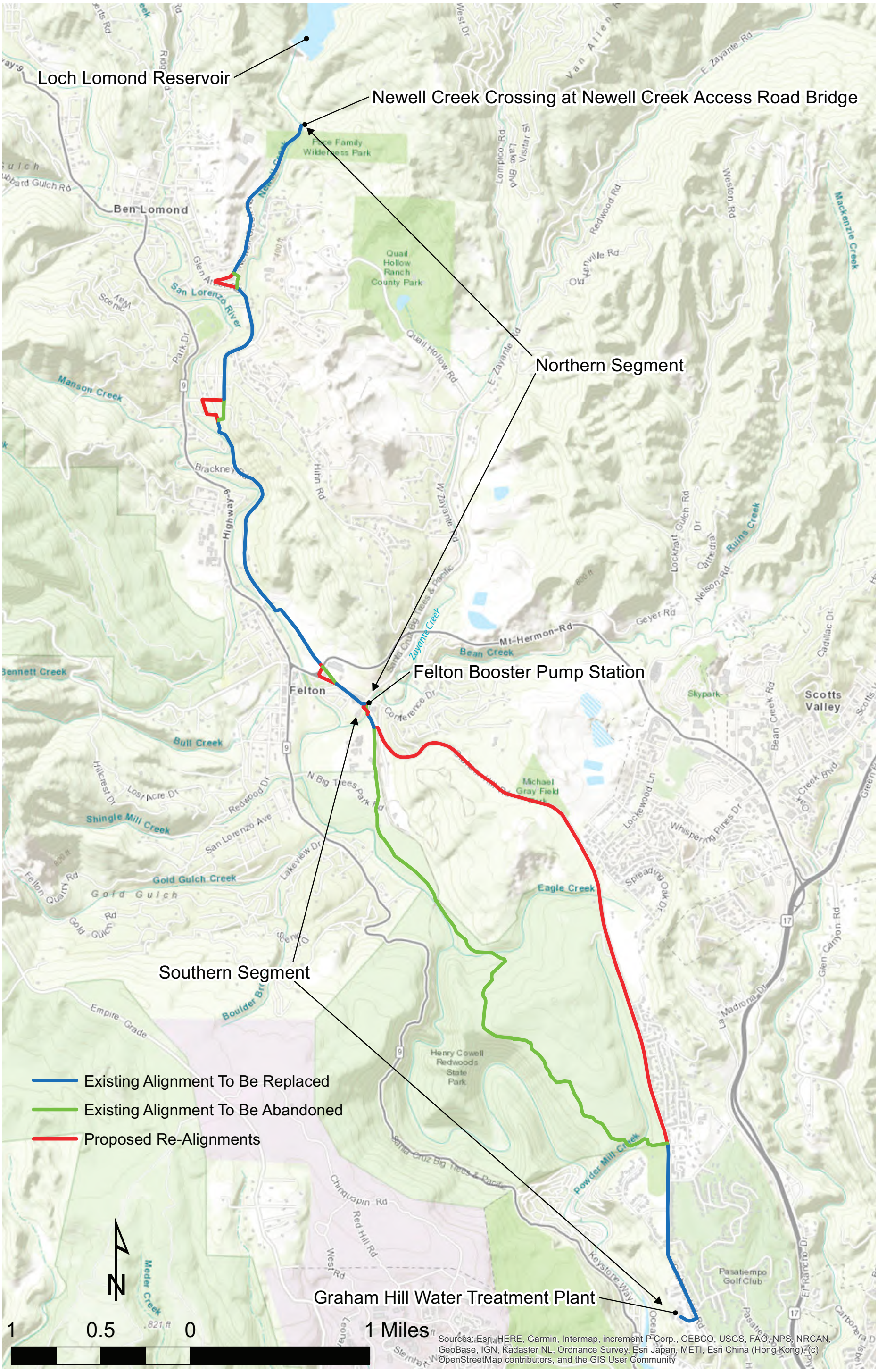


Fallin Steffen, MPS
Architectural Historian

P: 831.400.8882
E: fsteffen@dudek.com

Enclosure

Figure 1. Proposed Newell Creek Pipeline Improvement Project Overview



SOURCE: City of Santa Cruz Water Department 2020

FIGURE 1

Proposed Newell Creek Pipeline Improvement Project Overview

From: Fallin Steffen
To: Felicia Van Stolk
Subject: FW: Newell Creek Pipeline Improvement Project
Date: Friday, April 16, 2021 2:48:34 PM
Attachments: SCMNH.pdf

Hello Ms. Van Stolk,

I am reaching out today on behalf of Dudek and the City of Santa Cruz Water Department to provide you with some information about the Newell Creek Pipeline Improvement Project. As part of the cultural resources study for the proposed project, Dudek is consulting all regional historical organizations to determine if there are any known historic or cultural resources that may be within the proposed project area. Please see the attached letter and map for more information about the nature and location of the project, and please feel free to contact me should you have questions or information regarding cultural or historical resources in this area.

Thank you,

Fallin Steffen, MPS
Architectural Historian
C: 831.400.8882
www.dudek.com

From: Fallin Steffen
To: Ashley Holmes
Subject: Newell Creek Pipeline Improvement Project
Date: Friday, April 16, 2021 2:47:08 PM
Attachments: MAH.pdf

Hello Ms. Holmes,

I am reaching out today on behalf of Dudek and the City of Santa Cruz Water Department to provide you with some information about the Newell Creek Pipeline Improvement Project. As part of the cultural resources study for the proposed project, Dudek is consulting all regional historical organizations to determine if there are any known historic or cultural resources that may be within the proposed project area. Please see the attached letter and map for more information about the nature and location of the project, and please feel free to contact me should you have questions or information regarding cultural or historical resources in this area.

Thank you,

Fallin Steffen, MPS
Architectural Historian
C: 831.400.8882
www.dudek.com

From: Fallin Steffen
To: "slvhm@cruzio.com"; "slvmuseum@sbcglobal.net"
Subject: Newell Creek Pipeline Improvement Project
Date: Friday, April 16, 2021 2:50:40 PM
Attachments: SLVM.pdf

To Whom It May Concern,

I am reaching out today on behalf of Dudek and the City of Santa Cruz Water Department to provide you with some information about the Newell Creek Pipeline Improvement Project. As part of the cultural resources study for the proposed project, Dudek is consulting all regional historical organizations to determine if there are any known historic or cultural resources that may be within the proposed project area. Please see the attached letter and map for more information about the nature and location of the project, and please feel free to contact me should you have questions or information regarding cultural or historical resources in this area.

Thank you,

Fallin Steffen, MPS
Architectural Historian
C: 831.400.8882
www.dudek.com

From: Fallin Steffen
To: "speccoll@library.ucsc.edu"
Subject: Newell Creek Pipeline Improvement Project
Date: Friday, April 16, 2021 2:51:51 PM
Attachments: UCSC.pdf

To Whom It May Concern,

I am reaching out today on behalf of Dudek and the City of Santa Cruz Water Department to provide you with some information about the Newell Creek Pipeline Improvement Project. As part of the cultural resources study for the proposed project, Dudek is consulting all regional historical organizations to determine if there are any known historic or cultural resources that may be within the proposed project area. Please see the attached letter and map for more information about the nature and location of the project, and please feel free to contact me should you have questions or information regarding cultural or historical resources in this area.

Thank you,

Fallin Steffen, MPS
Architectural Historian
C: 831.400.8882
www.dudek.com

From:	Luisa Haddad
To:	Fallin Steffen
Cc:	abnorton@ucsc.edu; began@ucsc.edu; gravier@ucsc.edu; jpigza@ucsc.edu; dundon@ucsc.edu; tmora1@ucsc.edu; orlando@ucsc.edu; ihreti@ucsc.edu; jaffer@ucsc.edu
Subject:	[Special Collections & Archives] Newell Creek Pipeline Improvement Project
Date:	Thursday, April 22, 2021 2:46:39 PM

Response from Luisa Haddad

Apr 22 2021, 02:45pm via System

Dear Fallin Steffen,

Thank you for contacting Special Collections & Archives regarding cultural and historical resources in your project's boundaries.

Information about archaeological and cultural resources for the campus are maintained by the Physical planning, Development and Operations department. We do appreciate your providing this information for us to add to our University Archives.

Best wishes,

Luisa Haddad

Public Services Coordinator

Original Question

Apr 16 2021, 02:52pm via Email from fsteffen@dudek.com

Newell Creek Pipeline Improvement Project

To Whom It May Concern,

I am reaching out today on behalf of Dudek and the City of Santa Cruz Water Department to provide you with some information about the Newell Creek Pipeline Improvement Project. As part of the cultural resources study for the proposed project, Dudek is consulting all regional historical organizations to determine if there are any known historic or cultural resources that may be within the proposed project area. Please see the attached letter and map for more information about the nature and location of the project, and please feel free to contact me should you have questions or information regarding cultural or historical resources in this area.

Thank you,

Fallin Steffen, MPS

Architectural Historian

C: 831.400.8882

www.dudek.com

Attached Files

- UCSC.pdf

Public Services Coordinator Special Collections and Archives McHenry Library University of California, Santa Cruz

This email is sent from Ask the Library in relationship to ticket #7221044.

Read our privacy policy.

From: Felicia Van Stolk
To: Fallin Steffen
Subject: Re: FW: Newell Creek Pipeline Improvement Project
Date: Thursday, April 22, 2021 12:12:30 PM

Hello Fallin,

Thank you for your inquiry. Our collections do not contain records relevant to the possible presence of any cultural or historical resources that might be impacted by the proposed project.

Please let me know if you have any further questions.

Felicia B. Van Stolk
Executive Director
felicia@santacruzmuseum.org
(831) 420-6115 x 11 | Mon-Fri
She/Her/Hers

Santa Cruz Museum of Natural History
Connecting people with nature and science to inspire stewardship of the natural world.
santacruzmuseum.org | Facebook | Instagram | Twitter

On Fri, Apr 16, 2021 at 2:48 PM Fallin Steffen <fsteffen@dudek.com> wrote:

> Hello Ms. Van Stolk,
>
> I am reaching out today on behalf of Dudek and the City of Santa Cruz Water Department to provide you with some information about the Newell Creek Pipeline Improvement Project. As part of the cultural resources study for the proposed project, Dudek is consulting all regional historical organizations to determine if there are any known historic or cultural resources that may be within the proposed project area. Please see the attached letter and map for more information about the nature and location of the project, and please feel free to contact me should you have questions or information regarding cultural or historical resources in this area.
>
> Thank you,
>
> **Fallin Steffen, MPS**
>
> Architectural Historian
>
> 

C: 831.400.8882

www.dudek.com

Appendix F

DPR forms for Newell Creek Pipeline

State of California ♦ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial
NRHP Status Code 6Z

Other Listings
Review Code Reviewer Date

Page 1 **of** 44 ***Resource Name or #:** (Assigned by recorder) Newell Creek Pipeline
P1. Other Identifier:
*__P2. Location:__ ☐ **Not for Publication** ■ **Unrestricted**
***a. County** Santa Cruz **and** (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** Felton **Date** 1998 **T** 9S; 10S; 11S; **R** 2W; **S** 34; 03, 04, 08, 18; Mt. Diablo **B.M.**
c. Address _____ City _____ Zip _____
d. UTM: (Give more than one for large and/or linear resources) Multiple Datums (See Continuation Sheet)
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, decimal degrees, etc., as appropriate)

The existing Newell Creek Pipeline (NCP) is located in the Santa Cruz Mountains in the unincorporated area of Santa Cruz County, except for the portion that extends onto the City's Graham Hill Water Treatment Plant (GHWTP) property (See Location Map and Continuation Sheets for information on the location of the resource).

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The NCP is 9.25 miles long and located in the unincorporated areas of Santa Cruz County. Access to the NCP is provided via Newell Creek Road, Glen Arbor Road, Brackney Road, San Lorenzo Way, Rose Acres Lane, Graham Hill Road, Mount Hermon Road, State Route 9, Pipeline Road (a paved trail through Henry Cowell Redwoods State Park), and via existing City easements **(See Continuation Sheet).**

***P3b. Resource Attributes:** (List attributes and codes) HP20. Canal/aqueduct



***P4. Resources Present:** ☐ Building ■ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)
P5b. Description of Photo: (view, date, accession #) Figure 1. Datum P-PR 2, view looking east

***P6. Date Constructed/Age and Source:** ■ Historic ☐ Prehistoric ☐ Both
1960 (Santa Cruz Sentinel 1960d)

***P7. Owner and Address:**
City of Santa Cruz
809 Center Street
Santa Cruz, CA 95060

***P8. Recorded by:** (Name, affiliation, and address) Fallin Steffen, MPS
Dudek
725 Front Street, 400
Santa Cruz, CA 95060

***P9. Date Recorded:**
December 2, 9, and 16, 2020

***P10. Survey Type:** (Describe) Intensive Pedestrian

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.")
Dudek. 2021. Historical Resources Inventory and Evaluation Report for the Newell Creek Pipeline Improvement Project.

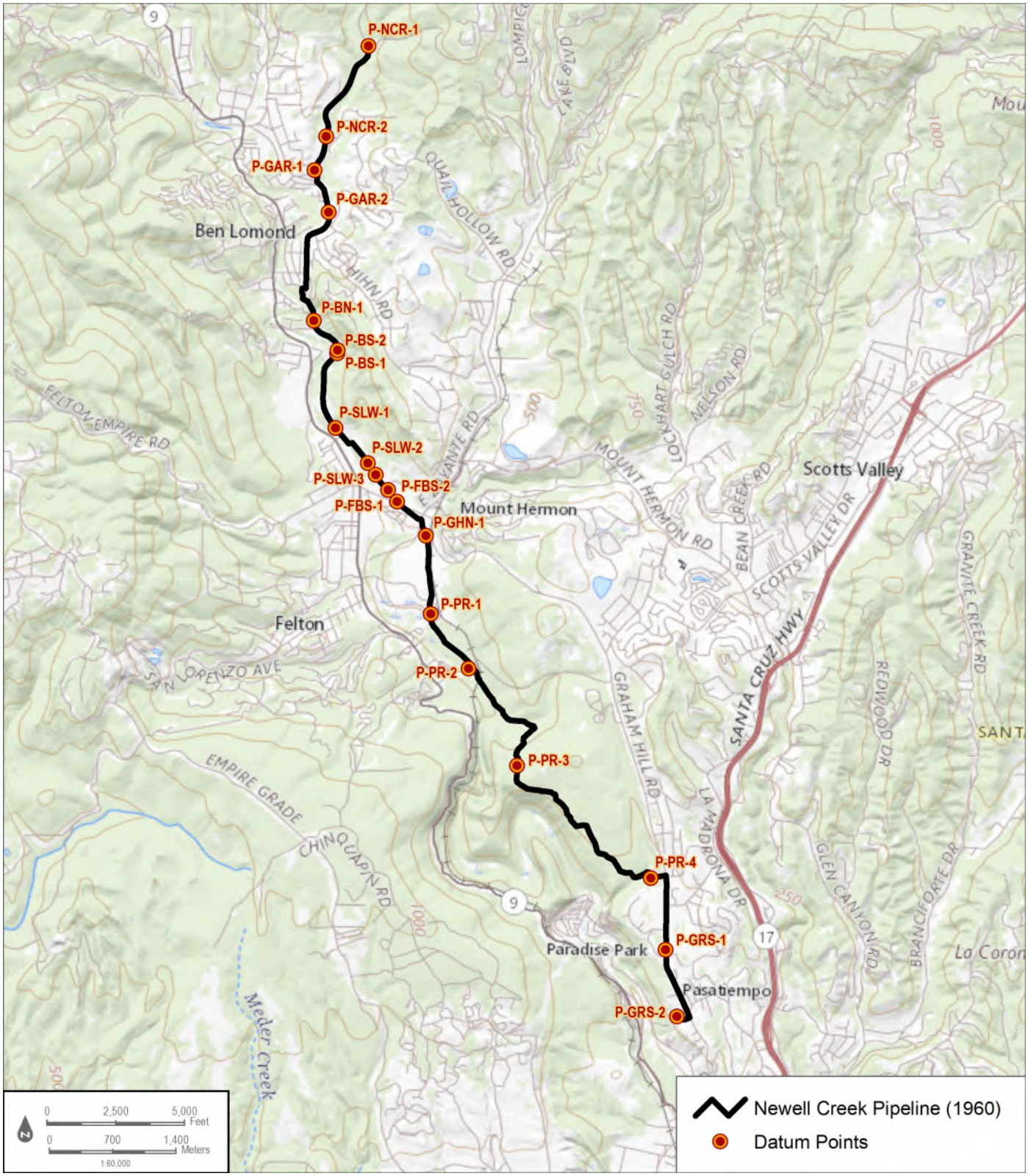
***Attachments:** ☐NONE ■Location Map ■Continuation Sheet ■Building, Structure, and Object Record
☐Archaeological Record ☐District Record ■Linear Feature Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☐ Other (List): _____

State of California ◆ Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI#
Trinomial

Page 2 **of** 44 ***Resource Name or #** (Assigned by recorder) Newell Creek Pipeline
***Map Name:** USGS The National Map ***Scale:** 1:24,000 ***Date of map:** May 2020



State of California ◆ The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary #
HRI#

BUILDING, STRUCTURE, AND OBJECT RECORD

***Resource Name or #** (Assigned by recorder) Newell Creek Pipeline ***NRHP Status Code** 6Z
Page ___ **of** 44

B1. Historic Name: Newell Creek Pipeline
B2. Common Name:
B3. Original Use: Water conveyance B4. Present Use: Water conveyance
***B5. Architectural Style:** Pipeline
***B6. Construction History:** (Construction date, alterations, and date of alterations)

The Newell Creek Pipeline was completed in 1960. Alterations to the pipeline include: emergency repair and realignment to correct landslide damage within the Brackney North Segment in 1982; disconnection of the Cathodic Protection System in 1986; emergency repair and realignment to correct landslide damage within the Brackney North Segment in 2017; replacement of northern-most segment of section of the pipeline from the Newell Creek Dam to the Newell Creek Access Bridge as part of the Newell Creek Dam Inlet/Outlet Replacement Project in 2020; and replacement of air vent heads and culverts at unknown times.

***B7. Moved?** ■**No** ☐**Yes** ☐**Unknown** **Date:** ___ **Original Location:** ___
***B8. Related Features:**

B9a. Architect: Brown and Caldwell Civil and Chemical Engineers b. Builder: Granite Construction

***B10. Significance: Theme** ___ **Area** ___

Period of Significance ___ **Property Type** ___ **Applicable Criteria** N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The Newell Creek Pipeline is ineligible for listing in the NRHP and the CRHR due to a lack of historical associations and engineering merit. For these same reasons, the property also does not rise to the level of significance for local designation in the SCCHRI. Therefore, the Newell Creek Pipeline is not considered an historic property under Section 106 of the NHPA nor an historical resource under CEQA.

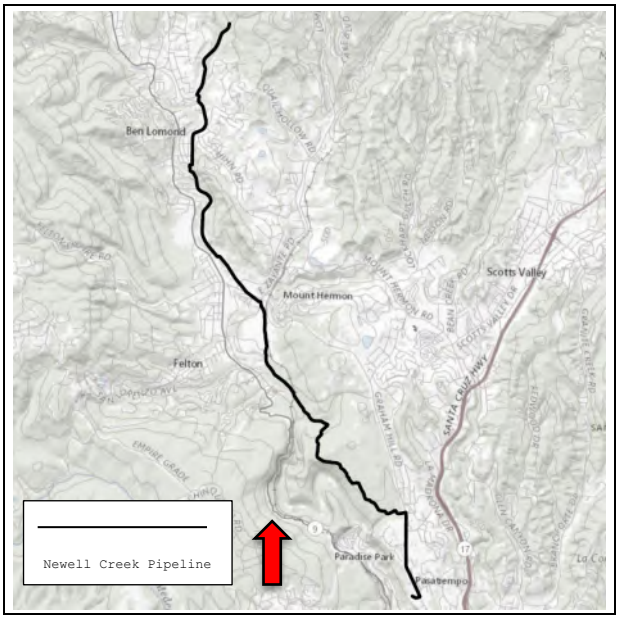
(See Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes) ___

***B12. References:** **(See Continuation Sheet)**

B13. Remarks:

***B14. Evaluator:** Fallin Steffen, M.P.S., Dudek
***Date of Evaluation:** 04/09/2021



(This space reserved for official comments.)

State of California ♁ The Resources Agency Primary #
DEPARTMENT OF PARKS AND RECREATION HRI#

LINEAR FEATURE RECORD

Trinomial _____

Page 4 **of** 44 ***Resource Name or #** (Assigned by recorder) Newell Creek Pipeline

L1. Historic and/or Common Name: Newell Creek Pipeline

L2a. Portion Described: ■ Entire Resource □ Segment □ Point Observation **Designation:** Datum

b. Location of point or segment: (Provide UTM coordinates, decimal degrees, legal description, and any other useful locational data. Show the area that has been field inspected on a Location Map.)

See Location Map and Continuation Sheets for information on the Datum Points

L3. Description: (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate.) See P3a. Description and Continuation Sheets

L4. Dimensions: (In feet for historic features and meters for prehistoric features)

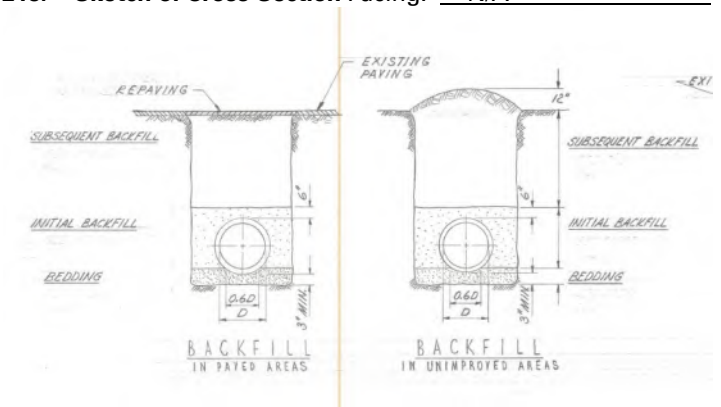
a. Top Width: Pipeline Diameter Ranges from 18 to 27 inches

b. Bottom Width: N/A

c. Height or Depth: N/A

d. Length of Segment: 9.5 Miles

L4e. Sketch of Cross-Section Facing: N/A



L5. Associated Resources: N/A

L6. Setting: (Describe natural features, landscape characteristics, slope, etc., as appropriate.):
The NCP is oriented roughly north/south and is predominately underground as it passes through densely forested areas and residential properties. The NCP daylights at approximately three locations along the route.

L7. Integrity Considerations: The NCP retains its historic alignment, original length, and continues to function as a water pipeline. As such, the NCP retains integrity of location, design, and association. The setting surrounding the NCP has been altered through dense residential and commercial development since 1960 when the structure was completed. As a result, the NCP retains only diminished integrity of setting and feeling. In addition to large repairs to sections of the NCP in 1982 and 2017, the NCP has been periodically maintained, which has resulted in the replacement of original materials including associated appurtenances. Due to this, the NCP no longer retains integrity of materials and workmanship.



L8b. Description of Photo, Map, or Drawing (View, scale, etc.) Figure 2. NCP pipeline segment environment, view looking northwest from Datum P-BN_1

L9. Remarks:

L10. Form Prepared by: (Name, affiliation, and address) Fallin Steffen, M.P.S.
Dudek
725 Front Street, 400
Santa Cruz, CA 95060

L11. Date: 04/09/2021

***P2. Location (continued):**
To document various aspects of the NCP segment, including the variety of materials and features, the pipeline was recorded at 19 different points of access along the pipeline path (Datum P-NCR_1 through Datum P-GRS_2). Recordation of the pipeline began at the northernmost point (Datum P-NCR_1), and continued until the southernmost point (Datum D). The Datum location key is provided in the Location Map and all corresponding photographs are provided below in Table 1.

All Datums are located in Zone 10S.

Datum P-NCR_1: 582367.68 mE/ 4106033.53 mN;
Datum P-NCR_2: 581928.34 mE/ 4105020.06 mN;
Datum P-GAR_1: 581807.50 mE/ 4104640.22 mN;
Datum P-GAR_2: 581977.27 mE/ 4104182.31 mN;
Datum P-BN_1: 581844.95 mE/ 4102975.90 mN;
Datum P-BS_1: 4102658.76 mE/ 4102658.76 mN;
Datum P-BS_2: 582112.16 mE/ 4102624.01 mN;
Datum P-SLW_1: 582114.86 mE/ 4101796.69 mN;
Datum P-SLW_2: 582485.20 mE/ 4101415.53 mN;
Datum P-SLW_3: 582485.20 mE/ 4101289.26 mN;
Datum P-FBS_1: 582715.60 mE/ 4101124.21 mN;
Datum P-FBS_2: 4101124.21 mE/ 4100999.07 mN;
Datum P-GHN_1: 583148.82 mE/ 4100630.41 mN;
Datum P-PR_1: 583224.72 mE/ 4099767.31 mN;
Datum P-PR_2: 583659.84 mE/ 583659.84 mN;
Datum P-PR_3: 584224.86 mE/ 4098114.86 mN;
Datum P-PR_4: 585741.81 mE/ 4096908.65 mN;
Datum P-GRS_1: 585926.33 mE/ 4096120.67 mN;
Datum P-GRS_2: 586216.74 mE/ 4095379.71mN;

***P3a. Description (continued):**
To document various segments of the NCP, including the variety of materials and features, as well as the surrounding setting of each segment, the structure was recorded at multiple points within each of the existing segments discussed in Table 1 below. Recordation of the NCP began at the northernmost point (Datum P-NCR_1) and continued until the southernmost point (Datum P-GRS_2).

Table 1. Newell Creek Pipeline Existing Segment Survey Summary

Existing Segment (*Abbr.*)	**Description**	**Associated Datum Point Photographs**
Newell Creek Road *(NCR)*	Segment runs along Newell Creek Road from the Newell Creek Access Road Bridge and bypassing the intersection of Newell Creek Road and Glen Arbor Road by heading due south between homes before reemerging at Glen Arbor Road.	 **Datum P-NCR_1,** view looking north (DSCN6303)  **Datum P-NCR_2,** view looking south (DSCN6333)
Glen Arbor Road *(GAR)*	The NCP continues south onto Glen Arbor Road and continues south through an existing easement until meeting the north end of the Brackney North Section.	 **Datum P-GAR_1,** view looking north (DSCN6335)

Table 1. Newell Creek Pipeline Existing Segment Survey Summary

Existing Segment (*Abbr.*)	**Description**	**Associated Datum Point Photographs**
		 **Datum P-GAR_2,** view looking south(iPad P-GAR_2a)
Brackney North (BN)	Runs along an abandoned Felton and Pescadero Railroad bed alongside the San Lorenzo River between a Glen Arbor Road neighborhood and the Brackney Road neighborhood.	 **Datum P-BN_1,** view looking northwest (iPad P-BN-1a)

Table 1. Newell Creek Pipeline Existing Segment Survey Summary

Existing Segment (*Abbr.*)	**Description**	**Associated Datum Point Photographs**
Brackney South (BS)	Extends south from the Brackney North Section abandoned Felton and Pescadero Railroad bed and partially along unpaved easement and before ending at the property boundary at north end of San Lorenzo Way/Rose Acres Lane.	 **Datum P-BS_1,** view looking north (iPad P-BS-1a)  **Datum P-BS_2,** view looking north (iPad P-BS-2b)

Table 1. Newell Creek Pipeline Existing Segment Survey Summary

Existing Segment (*Abbr.*)	Description	Associated Datum Point Photographs
San Lorenzo Way (SLW)	Runs from north to south end of San Lorenzo Way/Rose Acres Lane and through private property to the edge of Mount Hermon Road.	 **Datum P-SLW_1,** view looking southeast (DSCN6277)  **Datum P-SLW_2,** view looking south (iPad P-SLW_2a)  **Datum P-SLW_3,** view looking southeast (DSCN6301)

Table 1. Newell Creek Pipeline Existing Segment Survey Summary

Existing Segment (*Abbr.*)	**Description**	**Associated Datum Point Photographs**
Felton Booster Pump Station (FBS)	Crosses Mount Hermon Road and runs diagonally through the southwest corner of the commercial parking lot before joining and following Graham Hill Road southeast to the Felton Booster Pump Station.	 **Datum P-FBS_1,** view looking south (iPad P-FBS_1b)  **Datum P-FBS_2,** view looking northwest (iPad P-FBS_2a)
Graham Hill Road North (GHN)	From the Felton Booster Pump Station, crosses beneath Zayante Creek, runs alongside Graham Hill Road before heading southward past the Santa Cruz Lumber Company into Henry Cowell Redwood State Park.	

Table 1. Newell Creek Pipeline Existing Segment Survey Summary

Existing Segment (*Abbr.*)	**Description**	**Associated Datum Point Photographs**
		Datum P-GHN_1, view looking northwest (DSCN6379)
Pipeline Road (PR)	The NCP heads roughly southeast through the park before exiting Henry Cowell State Park and meeting Graham Hill Road at the intersection of Graham Hill Road and Pipeline Road.	 **Datum P-PR_1,** view looking north (DSCN6343)  **Datum P-PR_2,** view looking north (DSCN6719) 

Table 1. Newell Creek Pipeline Existing Segment Survey Summary

Existing Segment (*Abbr.*)	**Description**	**Associated Datum Point Photographs**
		Datum P-PR_3, view looking north (DSCN6592)  **Datum P-PR_4,** view looking east (DSCN6396)
Graham Hill Road South (GRS)	Follows Graham Hill Road from southern entrance of Henry Cowell Redwoods State Park to terminus at GHWTP.	 **Datum P-GRS_1,** view looking north (PC160048)  **Datum P-GRS_1,** view looking southeast (PC160053)

Appurtenances related to the NCP including air vents, valve access boxes, wharf hydrants, culverts, the cathodic protection box (now abandoned), and a meter pit are also visible along the route. These features are described generally in Table 2 below.

Table 2. Newell Creek Pipeline Associated Appurtenances

Appurtenances	Description	Photograph
Air Vent: Type A	Metal air vent extending from the ground. The majority of the original vent heads (top) have been replaced with smaller, PVC vent heads (bottom).	 Air vent with original head (DSCN6537)  Air vent with replaced head (iPad V-NCR_1a)

Table 2. Newell Creek Pipeline Associated Appurtenances

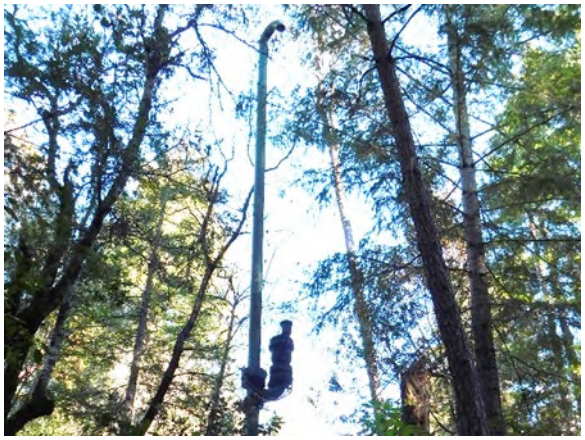
Appurtenances	Description	Photograph
Air Vent: Type B	Tall (over 10 feet) metal air vent with curved vent head and back flow valve.	 (DSCN6512)
Valve Access Box	Concrete vault box with corresponding metal access covers.	 (iPad P-BN_1b)

Table 2. Newell Creek Pipeline Associated Appurtenances

Appurtenances	Description	Photograph
Wharf Hydrants	Metal fire hydrant extending from the ground with the upper section painted yellow.	 (DSCN6401)
Culverts	New and historic culverts along the pipeline route are constructed from a variety of materials including concrete (top), corrugated metal, corrugated PVC material, and in one instance within the Brackney South Segment, a wood culvert that was originally constructed in conjunction with the Felton and Pescadero Railroad in 1885 (bottom).	 Concrete Culvert (DSCN6222)  Wooden Culvert (DSCN6231)

Table 2. Newell Creek Pipeline Associated Appurtenances

Appurtenances	Description	Photograph
Cathodic Protection Box (abandoned) and Meter Pit	The cathodic protection system no longer contains a galvanic anode system and is therefore no longer functioning.	 (DSCN6376)

***B10. Significance:**

Historical Overview of Santa Cruz County

Spanish Period (1769–1822)

The earliest known European exploration of the Monterey Bay was a Spanish envoy mission led by Sebastián Vizcaíno in 1602. The purpose of the voyage was to survey the California coastline to locate feasible ports for shipping, and Vizcaíno had explicit instructions prohibiting the creation of settlements and interacting with local Native Americans. Finding the bay to be commodious, fertile, and extremely favorable for anchorage during eastward voyages from Manila to Acapulco, Vizcaíno named the Bay "Monterey" after the Conde de Monterey, the present Viceroy in Mexico (Chapman 1920: 293-4; Hoover et al. 2002: 225-6).

Despite being mapped as an advantageous berth for Spanish shipping efforts, the epicenter of Spanish settlement in Alta California did not make its way to the Monterey Bay until the second half of the eighteenth century. In an effort to prevent the establishment of English and Russian colonies in northern Alta California, Don Gaspar de Portolá, the Governor of Baja, embarked on a voyage in 1769 to establish military and religious control over the area. This overland expedition by Portolá marks the beginning of California's Historic period, occurring just after King Carlos III of Spain installed the Franciscan Order to direct religious colonization in assigned territories of the Americas. With a band of 64 soldiers, missionaries, Baja (lower) California Native Americans, and Mexican civilians, Portolá established the Presidio of San Diego, a fortified military outpost, as the first Spanish settlement in Alta California. In July of 1769, Padre-Presidente Franciscan Fr. Junípero Serra founded Mission San Diego de Alcalá at Presidio Hill, the first of the 21 missions that would be established in Alta California by the Spanish and the Franciscan Order between 1769 and 1823, including Mission Santa Cruz (Hoover et al. 2002: 226; Lehmann 2000: 3; Koch 1973: 3).

On their quest to locate the Monterey Bay from the 160-year-old accounts of Sebastián Vizcaíno, the Portolá expedition first reached the present-day territory of Santa Cruz on October 17, 1769. After mistakenly circumventing the Monterey Bay and reaching the San Francisco Bay, the expedition backtracked to San Diego. The following year on May 31, 1770, a second expedition was organized by Portolá resulting in a successful location of the Monterey Bay. However, it would be an additional 21 years before the Franciscan order would establish Mission Santa Cruz in the area near the San Lorenzo River (Koch 1973: 2-3; Hoover et al. 2002: 447-8).

Father Fermín Lasuén, Corporal Luis Peralta, and five soldiers established Mission Santa Cruz on August 28, 1791, as the twelfth mission in the California Mission system. The Spanish Padres converted local Native Americans to Catholicism largely against their will, after which they were known as neophytes. Neophytes were forced to build the mission church and auxiliary structures from local timber, limestone, and adobe, as well as to cultivate wheat, barley, beans, corn, and lentils for their captors. In 1792, neophytes were directed to excavate a ditch for the purposes of carrying water from Tres Ojos de Agua (Three Eyes of Water), a group of three creeks near the modern entrance to the University of California, Santa Cruz campus, down to the Mission site. This ditch and the footpath beside it established the foundation for the future orientation of High Street in the City of Santa Cruz today, and offered the Mission a distinct advantage in a geographic area that often experienced water shortages during the summer months (Hoover et al. 2005: 448; Lehmann 2000: 3-4; SCWD n.d: 1).

From the start, Mission Santa Cruz was plagued by substantial issues. The forced conversion of the local native population by the Spanish Padres resulted in repeated rebellions, violence, desertion, and pestilence at Mission Santa Cruz. In 1793, the neophyte population attacked the Mission guards and burned their station to the ground. In 1798, Padre Fernandez reported that 189 of the approximately 230 neophytes living on the Mission grounds had abandoned the Mission, causing the crops to fail and the livestock to be largely neglected. The Mission also experienced problems wrought by a nearby settlement known as Villa de Branciforte (Lehmann 2000: 3-4).

In 1795, Spain established three self-governing Pueblos in Alta California that, unlike the Missions, would remain free from military and religious oversight. Villa de Branciforte was established in 1797 on the opposite bank of the San Lorenzo River from Mission Santa Cruz along the present-day alignment of both Branciforte Avenue and Branciforte Creek. The 40 settlers of Villa de Branciforte were not provided with the resources promised to build housing or cultivate the land and had to make do with crude dwellings of their own design. In 1803, there were 107 inhabitants, but because the population was made up of former soldiers, artisans, and criminals, they lacked the pertinent skill to farm and sustain themselves. Despite population growth in the initial years, the settlement was quickly deemed a failure by Spain (Lehmann 2000: 4-5).

By 1817, the population of Villa de Branciforte had dwindled to 52 people. In 1818, fearing the attack of the French pirate Hippolyte de Bouchard who had recently attacked the Monterey Presidio, the Mission Padres fled from the Mission Santa Cruz and placed the care of the complex with the remaining inhabitants of Villa de Branciforte. Instead of securing the Mission, the inhabitants of the Villa looted the valuable items from the complex while the Padres were away, including furniture, doors and flatware. Additionally, just under half of the 410 neophytes living at the Mission fled from the complex during the looting chaos and never returned (Lehmann 2000: 4-5).

Mexican Period (1822–1848)

After more than a decade of intermittent rebellion and warfare, New Spain (Mexico and the California territory) won independence from Spain in 1821. In 1822, the Mexican legislative body in California ended isolationist policies designed to protect the Spanish monopoly on trade, and decreed California ports open to foreign merchants. In addition to eliminating the system of Spanish nobility in California, the Spanish missions across the territory were secularized during this period (Koch 1973: 10; Lehmann 2000: 4).

The secularization of the Spanish Missions meant that all communal mission property was placed in a trust with the intention of being returned to the local Native American population. In Santa Cruz, the land stolen by the Spanish was returned to Native Americans between 1834 and 1839, but a smallpox epidemic in 1838 and reoccurring bouts of syphilis caused a massive decline in the Native American population from 284 persons in 1837 to only 71 persons in 1839. This meant that very few eligible Native American recipients remained to receive it, and records indicate that overall, only 25 Native Americans held property in the Santa Cruz area between 1834 and 1849 (Lehmann 2000: 4-5).

Extensive land grants were established in the interior during the Mexican Period, in part to increase the population inland from the more settled coastal areas where the Spanish had first concentrated its colonization efforts. Land grants to citizens covered over 150,000 acres of present-day Santa Cruz County. Three land grants covered the regions of the densely forested Santa Cruz Mountains that falls within Santa Cruz County, including *Rancho Zayante* (1841), *Rancho Cañada del Rincon en el Rio*

de San Lorenzo (1843) and *Rancho Carbonera* (1838) (Hoover et al. 2002: 455-457; Robinson 2012: 7).

The scarcity of water in the future City of Santa Cruz intensified towards the end of the Mexican Period with assistance from a formal decree by the Santa Cruz Alcalde, Don Manuel Rodriguez. In 1844, Rodriguez transferred the rights to the water carried by the 1792 aqueduct to the limited control of the mission and eight adjacent grant-holders. After this point, the growing population in the outlying areas of Santa Cruz became exclusively reliant on water taken from shallow wells and surface sources that were subject to seasonal surge and drought cycles, such as the San Lorenzo River (SCWD n.d.: 1).

American Period (1848–Present)
The Mexican American War ended with the Treaty of Guadalupe Hidalgo in 1848, ushering California into its American Period. Santa Cruz was designated as one of the 27 original counties of California on February 18, 1850, shortly before California officially became a state with the Compromise of 1850. The new State of California recognized the ownership of lands in the state distributed under the Mexican land grants of the previous several decades (Lehmann 2000: 5; Koch 1973: 35).

As the Gold Rush was picking up steam in 1849, a massive influx of people seeking gold steadily flooded the rural counties of California. The gold fields quickly dried up, causing many new arrivals to refocus on other economic opportunities. In Santa Cruz County, insightful entrepreneurs saw the arrival of opportunity-seeking laborers as a means to harvest the abundant natural resources found throughout the area. In the northern areas of the young county, the lumber, mining, fishing, tanning, and leisure industries formed the economic foundation of the County. In the central and southern areas of the County, early settlers took advantage of the fertile soil and temperate climate to establish large farms and dairies. Agricultural products including grain and apples were among the County's earliest and most successful (Lehmann 2000: 7).

As the County moved into the 1900s, agriculture and tourism continued as the region's most prominent economic drivers. By the late 1950s, the population began to expand with aid from the establishment of Cabrillo College in 1959 and the University of California at Santa Cruz in the 1965. These higher education facilities brought both students and jobs as the schools became major sources of community employment throughout the County. During the 1980s, a number of technology companies settled in the area due to its close proximity to Silicon Valley. Today, tourism, agriculture, manufacturing, and technology are the key industries that provide the economic base for County's 273,213 residents (U.S. Census Bureau 2019).

Development of Early Transportation Corridors in Santa Cruz County
The earliest railroad in the County was built and operated by the Southern Pacific Railroad (SPRR) in 1871, which was situated at the southern-most point of the County connecting the City of Watsonville with the City of Gilroy. In 1873, Fredrick A. Hihn and Claus Spreckels filed incorporation papers for the Santa Cruz Railroad, a narrow-gauge railroad line connecting the City of Watsonville to the City of Santa Cruz. The line, known as the Santa Cruz- Watsonville Railroad, was completed in 1876 and later purchased by a SPRR subsidiary in 1881 (Clark 2008: 309, 331).

As the number of lumber operations in the County grew rapidly, transportation infrastructure developed simultaneously to support the movement of goods from remote processing locations in the Santa Cruz Mountains. The earliest efforts to transport lumber and lime resulted in the construction of roads like as Graham Hill Road, or "Graham's Grade" as its was first known, which was completed by Isaac Graham in the 1840s leading from the upper reaches of the San Lorenzo Valley to the Santa Cruz Wharf. Graham was an American who arrived in California sometime during the 1830s, and after a brief imprisonment in Tepic, Baja California, he settled on Rancho Zayante in 1841 where he set up enterprises in lumbering, cattle ranching, leather tanning, and distilling. Although the road has been somewhat realigned, it has remained in continual use since its completion in the 1840s (Clark 2008: 130; Robinson 2012: 8).

Navigating the steep, angled roads through the valley while driving heavy, lumber-filled wagons was a dangerous undertaking even for experienced teamsters, but the unpredictability of seasonal weather changes often proved deadly. The unreliability of transporting lumber by wagon prompted the development of a flume along the San Lorenzo River to easily move the lumber to port instead. While the initial plan called for the flume to stretch over 20 miles from the mountains to the coast,

seasonal drought of the lower San Lorenzo River and tributary creeks encouraged the need instead for a narrow-gauge railroad to begin at the flume terminus in Felton leading down to the harbor. Work on the Felton Lumber Flume and the Santa Cruz and Felton Railroad (Figure 3) was completed simultaneously during 1875. The terminus of the 9-mile flume and the new rail line was in Felton, California, where the lumber originating as far as 2 miles north of Boulder Creek, floated down the water-driven flume and could be loaded onto the train and hauled safely downhill to shore. Overall, the water-powered gravity flume drastically increased the availability of Santa Cruz lumber to a wider market, while the rail line opened the San Lorenzo Valley up to tourism (Hoover et al. 2002: 462; Robinson 2012: 20).



Figure 3. An early photograph of the Felton Flume (center) alongside the narrow gauge Santa Cruz and Felton Railroad (engine and tracks at right) (University of California, Santa Cruz Special Collections).

In 1876, construction of the South Pacific Coast Railroad began between Alameda and Santa Cruz via San José. When it was completed in 1880, the narrow-gauge railroad traveled southwest from Los Gatos into the densely forested areas on the Santa Clara side of the Santa Cruz Mountains before emerging into Santa Cruz County through a 6,200-foot tunnel at the summit. The line wound down through the small communities of Laurel, Glenwood, Clems, Doughertys, Zayante, and Felton before continuing along the tracks leased from Santa Cruz and Felton Railroad through Big Trees, Rincon, and the Powder Works before reaching the terminus in Santa Cruz (Clark 2008: 332).

In 1883, articles of incorporation were filed for the Felton and Pescadero Railroad company, which was intended to connect the town of Felton with the coastal town of Pescadero located in San Mateo County. The announcement of the newly formed company included a reference to the abundant virgin redwood forests of Big Basin that would be made accessible by the new railroad, claiming "the millions of lumber they will produce is beyond reasonable computation" (Santa Cruz Surf 1883: 3)." Bids for the first 7.5 miles of tracks between Felton and Boulder Creek including the "grading and bridging … of roadbed, also for the laying and surfacing of the track" (Santa Cruz Surf 1884: 1) were requested during the summer of 1884 and completed in 1885. The Felton and Pescadero line was almost immediately incorporated into the South Pacific Coast Railroad, and this section constitutes the only part of the Felton and Pescadero railroad that was ever completed. Small communities emerged along this new route including Brackney, Glen Arbor, Ben Lomond, and Brookdale (Santa Cruz Surf 1883: 3, 1884: 1; Clark 2008: 332).

In 1887, the Santa Cruz and Felton Railroad, the South Pacific Coast Railroad, and the Felton Pescadero Railroad incorporated together with several other small subsidiaries into the South Pacific

Coast Railway Company, which was then leased to the SPRR. The SPRR converted the original narrow-gauge tracks to broad-gauge beginning in 1905 (Figure 4), but the project was spectacularly delayed after the earthquake of 1906 caused widespread damage. It took nearly 3 years before the tracks were adequately repaired and the first broad-gauge train passed from Los Gatos to Santa Cruz in 1909. In 1934, the 7.5-mile section originally built as the Felton and Pescadero Railroad was decommissioned, and the tracks were pulled up. The remainder of the consolidated South Pacific Coast Railway Company was purchased outright by SPRR in 1937 and regular rail service along the line ceased in 1940 (Clark 2008: 111, 332; SC Evening News 1936a: 7).



Figure 4. A photograph showing the expansion of either the Santa Cruz and Felton Railroad or the Felton and Pescadero railroad from narrow to broad-gauge in the proximity of Felton, c. 1905 (University of California, Santa Cruz Special Collections).

Tourism Industry in Santa Cruz County

Interest in the beauty of the Monterey Bay drew visitors to the County beginning in the 1860s, causing beach tourism to emerge early on as another major industry in the County. Tourism was also responsible for quickening the rate of development along the scenic coastal areas of Santa Cruz County. The completion of railroads in the County, including the Santa Cruz and Felton Railroad in 1875, the Santa Cruz–Watsonville Railroad in 1876, and the South Pacific Coast Railroad in 1880, provided greater mobility into and throughout the County from the Bay Area and inland areas of the state by both residents and tourists alike. As the rise of trains also reconfigured shipping from the Santa Cruz wharf to the new railroads, shipping from the wharf altogether declined due to lack of use and the ease of transport by train, the beachfront areas of the City presented savvy entrepreneurs with new emerging opportunities (Lehmann 2000: 14, 25-6).

By 1893, Harper's Weekly acknowledged the County as a beach destination, promoting beachside institutions like the Neptune Baths built in 1884 by Captain C.F. Miller, and giving the coastal destinations, including Fredrick A. Hihn's Camp Capitola, the push needed to become national tourist destinations. The economic transition away from the early industries of the County towards tourism during this period helped to alleviate the strain placed on the forests in the north of the County, which had experienced widespread deforestation as a result of early logging and lime production

activities in that area. By the close of the nineteenth century, few old-growth redwood specimens remained in the forests of the Santa Cruz Mountains, and as it became increasingly clear that these trees were capable of drawing crowds on their own, their conservation became a dual effort to both save the trees and simultaneously promote Santa Cruz County as a one-stop tourism destination. With the help of the railroads, a tourist to the County could visit the seaside attractions as well as the groves of *Sequoia Sempervirens*, or coastal redwoods, within a single day. While the coastal redwood occupied several areas within the County, a grove located south of Felton alongside the San Lorenzo River known as Felton Big Trees, or Big Trees, and two distinct Big Trees resorts were developed within this area during the late nineteenth century, which were formally separated only by a fence. The Santa Cruz and Felton Railroad line included Big Trees stop, which allowed for ease of access to the otherwise remote locations of these parks (Figure 5) (Lehmann 2000: 14).



Figure 5. A postcard showing the Big Trees railroad stop along the Santa Cruz and Felton Railroad south of Felton, c. 1920s (University of California, Santa Cruz Special Collections).

The earliest Big Tree resort was established by Joseph Warren Welch on his 350-acre property sometime after 1867. Welch's Big Tree Grove contained conveniences including a lodging house, a saloon, a store, and an outdoor event venue. In 1930, the Welch family sold the property to the County for the creation of a local park, which became known as Santa Cruz County Big Trees Park (Clark 2008: 28).
The second resort was established in 1895 to the south of Welch's resort on property that was owned by the Cowell family. Cowells Big Tree park included guest cabins, a coffeeshop, and a souvenir shop. The park was leased to the Hopkins family in later years before it was finally closed to the public in 1942. In 1954, as a memorial following the death of his father, Samuel H. Cowell donated 1,623-acres of land including the Cowells Big Trees property to the State of California. During the same year, the donation to the State was combined with the former Welch's Big Tree Grove property comprising the Santa Cruz County Big Trees Park to form, the Henry Cowell Redwoods State Park. The new park named after Samuel Cowell's late father, Henry Cowell (Clark 2008: 28).

In 1963, as interest in the now non-operational railroads in the Santa Cruz Mountains grew, Norman Clark established a private amusement park known as Roaring Camp & Big Trees Narrow Gauge Railroad alongside the Henry Cowell Redwood State Park, where it was advertised that "1860s steam locomotives climb the western U.S.'s steepest railroad grades through groves of giant redwoods" (Clark 2008: 282). In 1985, Clark purchased the tracks and ROW for the SPRR between Santa Cruz to Olympia (composed of the former Santa Cruz and Felton Railroad path and a portion of the South Pacific Coast Railroad path) and formed the Big Trees and Pacific Railway Company to provide rail tours between Felton and Santa Cruz (Clark 2008: 282, 331).

Water Management in North Santa Cruz County

Early Water Management in Santa Cruz County
Several miles north of the evolving city center at the base of the Santa Cruz Mountains, multiple mountain streams and tributaries carve deep channels and valleys through the dense redwood and oak timberlands. The extensive virgin forests and the rich underground deposits of lime in the Santa Cruz Mountains attracted opportunistic settlers and purveyors in the mid- to late-1800s who sought to harness the power of the mountain streams to move the goods located in the remote area to market (Hoover et al. 2002: 456).

The California Gold Rush of 1848 accelerated the desirability of land across the state, and before long, access to water in the drought-prone region took on the highest level of importance. Instead of adopting an equal water access structure in the fashion of the eastern United States, the wealth potential of waterways during the Gold Rush shaped California water law into a "first in time, first in right" system known as Prior Appropriation. Under this system, riparian rights were granted to the first person to use a river or tributary for beneficial consumption like mining, farming, milling, or as-needed domestic use. When land in the Santa Cruz Mountains was subdivided and sold, access to the rivers and streams was enormously important. Not only did it mean that the initial use set out for a waterway was the primary use, it also meant that any subsequent uses could not supersede or negatively affect the chief use. The order that claims were recognized during this period established the foundation of the complicated system of water allocation rights still in use today in the County (Pisani 1984: 246–247).

Many of these powerful mountain streams and tributaries were utilized by early landowners and tenant entrepreneurs to make a profit from the natural resources that formed the early economic basis of the County. Several of these mountain creeks still bear the names of the first men who established mills or permanently settled beside them. Majors Creek was named for Joseph L. Majors who established a grist mill on the creek prior to serving as the County Treasurer between 1850 and 1853. Liddell Creek was named for George Liddell who moved to the Santa Cruz Mountains and established a sawmill on the creek in 1851. Newell Creek was named for Addison Newell who established a farm in the steep, V-shaped valley on the banks of the creek in 1867 (Koch 1973: 33–34; D. Clark 2008: 174, 187, 215). For others, the streams presented pure economic opportunity. The first power sawmill in California was built on Rancho Zayante by Isaac Graham in the 1842 and was driven by the waters of Zayante Creek. Isaac E. Davis and Albion P. Jordan of the Davis and Jordan Lime Company purchased a portion of Rancho Cañada del Rincon in 1853 as a promising quarry site. They also utilized the falling water on the property to process local lumber into fuel for their many kilns. The California Powder Works was established in 1865 on the bank of the San Lorenzo River on a portion of Rancho Carbonera. The

Powder Works used the river to grind raw materials used in the production of the first smokeless powder manufactured on the west coast of the United States. By 1868, there were a sizable number of business and industries that relied on water from County waterways to operate, including 12 water-powered lumber mills, 10 steam-powered lumber mills, and 9 shingle mills in operation within the County (D. Clark 2008: 130–131; Hoover et al. 2005: 456; Koch 1973: 36–37; Brown 2011: 4).

Water Management in the San Lorenzo Valley

By the late 1800s and early 1900s several small communities were scattered throughout the San Lorenzo Valley. These areas developed as a result of mining and lumber operations, the arrival of multiple railroads into the remote areas of the valley, and the increased popularity as a tourist destination for development of vacation homes.. The remote nature of these small subdivisions caused them to rely on small, self-contained water systems. The communities of Ben Lomond, Brookdale, and Boulder Creek for example, formed their own, distinct water systems designed to serve the needs of residents who occupied their vacation homes only a few weeks a year which were supplied by nearby springs and creeks by way of flumes or pipelines. When the County population doubled between 1900 to 1940 from 21,512 to 45,057 persons and more people moved permanently into the valley, the existing water systems became inadequate (SLVWD 2020; SCPL n.d.: 1).

Frequent droughts between 1912 and 1939 convinced San Lorenzo Valley leaders to form a water district to better control water, to serve the needs of the valley. After one failed attempt to form a county water district by election in 1939, the San Lorenzo Valley Water Department (SLVWD) was formed by the voters on April 3, 1941. Negative voter returns from the towns of Felton and Scotts Valley left those areas out of the district boundaries, which included Bear Creek, Boulder Creek, Alba, and Ben Lomond school districts, and part of the Sequoia school district (SLVWD 2020).

By the late 1950s, population growth and new development throughout the Valley had exacerbated an already tenuous water situation within the SLVWD. In 1959, the SLVWD signed an agreement with the City of Santa Cruz, in which the district sold the City its timber and mineral rights to the Newell Creek watershed, in exchange for one-eighth of the water rights from the water stored by Newell Creek Dam following its development in 1960. The development of the Newell Creek Dam and the Newell Creek Pipeline is discussed in detail in Section 3.3 below (SLVWD 2020).

Today, the SLVWD supports a population of approximately 35,000 people across roughly 60 square miles of service area encompassing the towns and communities of Ben Lomond, Boulder Creek, Brookdale, Felton, Lompico, and Zayante. The system also includes sections of the City of Scotts Valley, including two subdivisions (the Pasatiempo Pines and Manana Woods) and two mobile home parks (Vista del Lago and Spring Lakes) (SLVWD 2020; SVWD 2020).

Water Management in the City of Santa Cruz

As water management techniques were being applied to a variety of industries throughout the County, the successful technologies developed and used in early natural resource harvesting such as flumes and pumps prompted local residents in the City of Santa Cruz to consider why these were not being put to use for the benefit of drinking water. The following section provides an outline of specific projects and miles stones related to the development of water management systems in the City of Santa Cruz.

Private Development (1864–1916)

Beginning in the 1860s, acute cyclical water shortages and pollution prompted the development of several for-profit water systems in Santa Cruz. By the end of the 1880s, the two surviving major water companies, F.A. Hihn Water Works and the Santa Cruz Water Company, were joined into a single private business that competed with the new municipal water system that began in 1890 for almost three decades before being purchased by the City and integrated into the municipal system in 1916.

F.A. Hihn Water Works (1864)

In 1864, prompted by the issue of shortage, young entrepreneurs Elihu Anthony and Fredrick A. Hihn implored the Board of County Supervisors to allow them to dig trenches and lay redwood pipes to transport water throughout Santa Cruz. The "wooden tubes" were chosen as an inexpensive alternative to iron pipes (Santa Cruz Weekly Sentinel 1864: 2). The source of the water was an 8,000-gallon reservoir on Anthony's property supplied by water from Scott's Creek, and eager recipients of the water could gain access for a fee. (Brown 2011: 1–2; Santa Cruz Weekly Sentinel 1864: 2).

By 1876, the 1864 system was known as the F.A. Hihn Water Works, and it was the largest provider of water in the newly chartered City, with Dodero and Carbonera Creeks constituting its primary sources. The company predated the incorporation of Santa Cruz by 2 years (Koch 1973: 35; Brown and Dunlap 1956: 14; City of Santa Cruz 2020).

The Santa Cruz Water Company (1866)
In 1866 a new, fee-based, private water supply company was founded to share in the lucrative profits of the F.A. Hihn Water Works. A man named E. Morgan acquired rights to the waters of the San Lorenzo River in 1866, just prior to the town of Santa Cruz being officially incorporated later that year. He used these rights to install a section of pipework conveying water to the area known then as the "The Flats," which comprises the modern area of Pacific Avenue and Front Street (SCWD n.d.: 1).

In 1876, Morgan sold his system to a wealthy man from San Francisco named H.K. Lowe. Under Lowe's guidance, the Santa Cruz Water Company incorporated in July 1876 and began construction on a pumping station on the San Lorenzo River approximately 1 mile upstream from the City, as well as a new reservoir located on High Street. Morgan retained 50 company shares and became the resident engineer and superintendent of the Santa Cruz Water Company. By the end of 1876, the company had also installed a Branciforte Creek diversion to deliver water via a pipeline to a new reservoir located at the base of School Street. As the City continued to grow and the steam-powered pumping plant installed on the San Lorenzo River became the source of repeated water-quality concerns, the Santa Cruz Water company acquired partial water appropriation rights to the Majors (then called Cojo Creek) in 1881. After the acquisition, the company scrapped the whole San Lorenzo pumping plant for $800 (Santa Cruz Weekly Sentinel 1877a: 1; 1877b: 2; SCWD n.d.: 1).

For the next several years, the Santa Cruz Water Company focused its attention on the construction of a pipeline to divert water from Majors Creek. This effort was very costly and the company slipped into dire financial condition. In August 1886, the company along with all of its appurtenances was sold to the City, financed through the sale of bonds from the Bank of Santa Cruz and the Anglo-Californian Bank. Hihn bitterly opposed the issuance of the bonds and contested their legality in court. The matter reached the Supreme Court and the election in favor of the bonds was declared invalid in 1887. By this time however, the City had already operated the water system for over a year when it was re-conveyed to private owners in 1887 (Santa Cruz Weekly Sentinel 1882: 3; SCWD n.d.: 1; Santa Cruz Surf 1890a: 1).

The City voted again in March 1888 to put up the bonds necessary to purchase the Santa Cruz Water Company system from the private owners. However, while the City was in the process of securing the bonds for the purchase, the Santa Cruz Water Company system was covertly sold to F.A. Hihn in a private, backroom transaction before the City could obtain legal ownership. Hihn quickly consolidated the Santa Cruz Water Company system with his own system of works. This transaction effectively severed any opportunity the City had of acquiring an established water works system with which to launch their own public water system (Santa Cruz Daily Surf 1888a: 3, 1888b: 2; Santa Cruz Surf 1890a: 1).

F.A. Hihn continued to operate the consolidated system as the Santa Cruz Water Company and expanded the service area east into the Seabright neighborhood until his death in 1913 (SCWD n.d.: 1).

Public Development (1890–1917)
During the 1880s, the rising price of these fee-based water systems like the F.A. Hihn Water Works and the Santa Cruz Water Company prompted the City to explore their own, city-owned, public water option. After several disappointing attempts to acquire an existing system of water works, the City revised its approach and began planning to build a diversion system and storage reservoir from the ground up, prompting the development of the first municipal water project in Santa Cruz, the Laguna Creek Dam and the Cowell Reservoir. This project led the way for other ambitious water system development in the City including several other north coast stream diversions and the first pumping plant on the San Lorenzo River. In 1916, the City acquired the rights to the Santa Cruz Water Company and began to tie in the systems as one, forming the basis of the modern City system used today.

The Laguna Creek Dam and the Cowell Reservoir (1890)
In July 1888, the Common Council secured the water rights to the Laguna Creek. "The Laguna," the

Santa Cruz Sentinel reported, "is a rushing, roaring mountain stream, entirely rock bound and tree shaded above the falls where it is proposed to take the water out (Santa Cruz Sentinel 1888: 2)." The stream was capable of supplying 1.4 million gallons towards a City-owned water works. Plans were finally in motion for the construction of the first city-owned water works, supplied through a new pipeline by the waters of Laguna Creek, with reserve storage in a new City reservoir on Henry Cowell's ranch property known as the Cowell Street Reservoir, which was located roughly at the present site of the U.C. Santa Cruz Arboretum. The *Santa Cruz Surf* reported with excitement that the new project would mean open, municipal water so that each citizen of Santa Cruz could finally "quench his thirst with free water without 'dropping a nickel in the slot'" (Santa Cruz Surf 1890a: 1).

The bonds required to fund the construction of the City water works were secured within the following year, and in July 1889, a civil engineer named G.S. Schussler issues a report in favor of the project that valued the proposed undertaking at $260K (Santa Cruz Surf 1889a: 3, 1889b: 3).

The prominent San Francisco firm Risdon Iron Works was selected as the contractor, who were known for producing the great iron pipes for steam ships. The *Santa Cruz Surf* reported that work on the dam on Laguna Creek and the dam at the reservoir site would be completed by the San Francisco contracting firm Kelso and Dare (Santa Cruz Surf 1889c: 3).

On September 30, 1890, the *Santa Cruz Surf* reported that the reservoir and the pipeline of the City water works were nearly complete. The article published an in-depth description of the new Laguna Creek Dam (Figure 6), stating that (Santa Cruz Surf 1890b: 3):

> The dam across Laguna Creek just above the Henneuse place is one of the finest pieces of rubble stone work in the county and not to be excelled anywhere. The granite rocks used in its construction were taken from the bed of the creek, some of them weighing as much as two tons. The water will first be diverted from the Laguna at this point into a flume 3x4 feet and one hundred feet in length, also built of solid masonry. This is nearly level and terminates in a basin two feet lower, and into which the sand and sediment which may be carried in the water in a time of storm will settle. Gates are provided by means of which this basin can be cleared as often as required. From here the water will enter the 14-inch main through which it will be carried to the storage reservoir. This pipe follows the canyon of the Laguna creek as nearly as possible to the county road a distance of about three miles.


THE RETAINING DAM ON LAGUNA CREEK.

Figure 6. The earliest known photograph of the Laguna Creek Masonry Dam published in the Santa Cruz Surf in 1892 (Santa Cruz Surf 1892: 2).

On October 18, 1890, the last pipe connecting the Laguna Creek to the new Cowell Street Reservoir (Figure 7) was put into position. The pipeline emptied into the reservoir for storage and eventual distribution to the homes and businesses of Santa Cruz (Santa Cruz Surf 1890c: 3).



Figure 7. The earliest known photograph of the Cowell Street Reservoir published in the *Santa Cruz Surf* in 1892 (Santa Cruz Surf 1892: 2).

Reggiardo Creek Diversion (Flume 1891, Dam 1912)
A 965-foot-long flume was completed in 1891 connecting the west branch of Laguna Creek, colloquially known as Reggiardo Creek, to the main Laguna Creek by emptying out water to the north of the Laguna Creek Dam. The new flume was intended to help supplement the municipal supply from Laguna Creek, as the year-old Laguna Creek Dam was quickly inundated with sediment and less water than expected was being captured by the system overall (Santa Cruz Surf 1892: 2).

In 1912, R.S. Tait, the water superintendent, announced that a dam had been completed on Reggiardo Creek in order to aid in the supply of daily drinking water sourced from Laguna Creek. The level of Laguna Creek had been significantly reduced by a lack of rainfall in the watershed area, causing the supply of water in the impoundment to drop below sufficient levels to support the community (SC Evening News 1912: 2).

High Street Distribution Reservoir (1904)
In 1894, the City purchased a parcel of land located on the south side of High Street between present-day Laurent and Storey Streets for the construction of a Distribution Reservoir. The Cowell Reservoir was constructed to hold 60 million gallons, but it was carved into a porous limestone formation known as karst that caused approximately 1 million gallons of leakage daily. The Distribution Reservoir was intended to serve are a secondary reservoir for the Cowell Reservoir to preserve the water that was otherwise lost before it could be pumped into the distribution system (Santa Cruz County Assessor 1894; SCMU 2016: 1).

The site for the Distribution Reservoir overlapped Dodero Spring Creek (then called Meyrick Brook) and provided the added benefit of impounding a percentage of the water from this source while temporarily storing the water impounded from the City Water Works on Laguna and Reggiardo Creeks. The survey and specifications for the new reservoir were completed in 1895 and the Santa Cruz Sentinel reported that the reservoir would have a capacity of 2.5 million gallons and cover three-quarters of an acre. Construction on the reservoir began in 1904 and it was completed later that year (Santa Cruz Sentinel 1895: 3, 1903: 4, 1904: 3).

Liddell Spring Diversion (1913)
Discussions about securing the title to Liddell Spring and utilizing it as a source of municipal

water were gathering support in the City government beginning early in 1913. By July 1913, a pipeline between Liddell Spring and the main municipal pipeline from Laguna Creek was operational, and, at a rate of 590,000 gallons per day, was out-producing all the other existing municipal water sources (SC Evening News 1913a: 1).

Crossing Street Pump Station (1913)
In 1913, a new well was drilled on the San Lorenzo River at Crossing Street, just north of the present intersection of Highway 1 with the river. It was equipped by a 75-horsepower, 5-inch, three-step centrifugal pump that was installed by the United Iron Works. The pump was capable of pumping 500 gallons per minute and cost $1844 dollars at the time of installation (SC Evening News 1913b: 1).

Acquisition of the Santa Cruz Water Company System (1913–1916)
Fredrick Hihn passed away in 1913 and his ownership of the Santa Cruz Water Company passed to his children. The City seized the opportunity to acquire the Santa Cruz Water Company system, and in 1916 assumed full legal ownership of the entire system, which included right to water being drawn from Branciforte Creek, Carbonera Creek, Majors Creek, and the San Lorenzo River (SCWD n.d.: 2; Monterey American 1913: 7; SC Evening News 1914: 1).

Public Development (1918–1939)
Public development during this period was predominantly focused on the repair and upgrade of existing system components. Although upgrades and additions were added to the several major facilities to increase the ability to store and improve the overall quality of municipal water during this period, with projects such as the Bay Street Reservoir in 1924 and the New Crossing Street Pumping Plant in 1929, the output was not widely increased between 1917 and 1930. Service began expanding into the areas to the east outside of the City with focused initiatives like the East Side Water Extension during this period (Brown and Dunlap 1956: 1-2).

The Bay Street Reservoir (1924)
The Bay Street reservoir was completed in 1924 and was located 1 mile southeast of the Cowell Street Reservoir on a site to the east from the present intersection of Bay Street and Meder Street. The 35-million-gallon capacity open-air tank was built to replace the Cowell Street reservoir. The Bay Street reservoir was constructed of stone and lined with concrete and was intended to be much more capable of reserving water accumulated from the surface stream sources for use during the dry summer and fall months (Figure 8) (SCMU 2016: 1).



Figure 8. Construction of the Bay Street Reservoir in 1924 (SCPL 1924).

Crossing Street Pumping Plant (1929)

In 1929, the City completed a new, modern pumping plant on the Lorenzo River on the southern side of Crossing Street across from the 1913 Crossing Street Pumping Plant site (Figure 9). Once complete, the plant went by the same name as its predecessor until it eventually was known simply as the Municipal Pumping Plant. Today, it is called the Coast Pump Station. The new facility was designed by City engineer Roy Fowler and consisted of a pumping plant capable of producing 6 million gallons of potable water in a 24-hour period from the San Lorenzo River. The plant operated with the help of "diesel engines, pumps, motors, generators, and all other necessary auxiliary equipment" (SC Evening News 1928: 8). The plant also treated the water with chlorine, making it safer to drink (SCWD n.d.: 3; Brown and Dunlap 1956: 1; SC Evening News 1928: 8, 1929: 7).

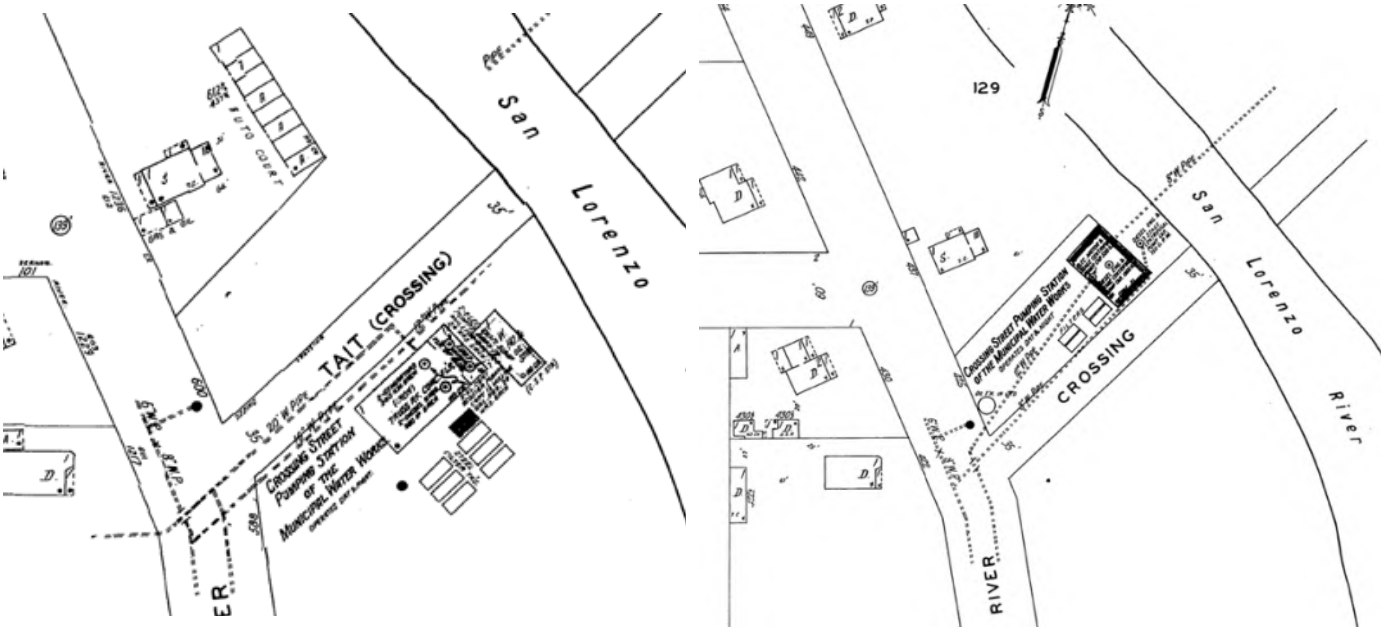


Figure 9. Comparison of the 1928 Sanborn Map (left) showing the old Crossing Street Pumping Plant and the 1928-1950 Sanborn Map showing the new facility completed in 1929 in approximately 1945 (right) (Sanborn Map Company 1928: 103, 1928-1950: 103).

The low rainfall in winter 1931 prompted the City to drill four more wells at the site of the Crossing Street Pumping Plant. One of the wells was located at the site of the pumping plant on the west side of the river, while the remaining three were drilled on the east bank. This increased the output of the municipal water supply greatly and allowed for expansion into other parts of the City. In 1934, the City boasted in the *Santa Cruz Sentinel* that 63.4 million gallons of water had earned the City a profit of $11,119 during April 1934 (Brown and Dunlap 1956: 14; SC Evening News 1931: 5; Santa Cruz Sentinel 1934a: 7).

In 1945, Crossing Street was renamed Tait Street for Water Superintendent R.S. Tait. A photograph of the Municipal Pumping Plant included in the 1956 investigative report into the Santa Cruz area water supply projects by engineers Brown and Dunlap demonstrates how the plant appeared during this period (Figure 10) (Santa Cruz Sentinel 1945: 8).



SANTA CRUZ MUNICIPAL PUMPING PLANT. Building houses low and high lift pumps and engine-driven generators. Pressure type filters are at right of building.

Figure 10. The Municipal Pumping Plant as it appeared in 1956 (Brown and Dunlap 1956: 18).

East Side City Water Extension (1934)
In 1934, work began on what was known as the East Side Water Extension, to extend the municipal water service into the Seabright and Live Oak areas of Santa Cruz via a new pipeline. Santa Cruz East Side residents C. W. Raisch, E. Brandt, George Ellison, Edith H. Evans, and Nathan Menderson donated the private property to the City needed for a right-of-way, and the pipeline extended from the municipal system to the areas of the City located on the east side of the San Lorenzo River. Additionally, two 1,000,000-gallon tanks were placed in De Laveaga Park in the north of the City as a reservoir for this branch of the system (Santa Cruz Sentinel 1933: 7, 1934b: 9).

Private Development (1936–1939)
In areas of the county that were not serviced by the municipal system, private systems such as the Beltz system were developed by residents to provide water for other residents of the area.

Beltz Water Company (1936)
In 1936, the County granted Iowa native, Charles Lemar Beltz, the rights to begin operating a private water system in the area of the County roughly bounded by Capitola Road to the north, Rodeo Gulch and Corcoran's Lagoon to the west, the bay to the south, and 41st Avenue to the east. The ambitious service area of the Beltz system covered approximately 25% of the Live Oaks district with water sourced from ground wells located throughout the district and conveyed through pipelines situated beside Live Oak roads (Santa Cruz Sentinel 1936: 8, 1947: 1; SC Evening News 1936b: 2).

Post-War Water Infrastructure Expansion (1945–1984)

Many of the post-war water projects in Santa Cruz can be characterized as repair of existing infrastructure and expansion of the overall water system to support rapid population growth. The years following World War II provoked westward migration and an increase in birth rates, causing the population of California to increase from 6.95 million to 10.65 million between 1940 and 1950. In Santa Cruz, the growth of the community from 27,430 to 41,680 between 1940 and 1950 caused the common seasonal water shortages during dry months to become problematic in regard to growth and potential for community expansion (SCPL n.d.: 1).

In 1945, the state recognized a water shortage in Santa Cruz and authorized an investigation of available water resources. In 1946, the acute nature of the water crisis prompted the community to request a survey to determine an inventory of the available groundwater supply and plan for growth in the future. Completed In 1948, the survey determined that although the San Lorenzo pumping plant was running at full capacity, 24 hours per day during the dry summer of 1947, the river was so low that the entire run was being diverted through the pumps and into the City mains for consumption (SWRCB 1953: 57; Brown and Dunlap 1956: 1–2).

Prompted by these concerns, in 1953, the State Water Resources Board released a report that inventoried available surface and underground water sources in the County and projected increased water utilization that exceeded the available water in Pajaro Valley, the Soquel Creek area, and the coastal area around and including Santa Cruz. The report identified requirements for supplemental water for Santa Cruz and areas served by the City of Santa Cruz Water Department (SWRCB 1953: 57).

The County formed the Santa Cruz County Flood Control and Water Conservation district in 1955 and hired Creegan & D'Angelo Civil Engineers in 1956 to complete an extensive survey identifying dam sites, groundwater sources, and additional steps to improve control of the water supply throughout the County to compete with the City's proposals. The report asserted that population growth was a major concern for the water supply in the City because "the City of Santa Cruz has current water requirements which equal the capacity of the existing water supply system during a relatively dry era. Should an exceptionally dry season be experienced, there would be a serious water shortage in the City of Santa Cruz" (Creegan and D'Angelo 1957: 8).

Present supplies were determined to be insufficient for standard rates of population growth, including years that rainfall was considered more plentiful. Despite the rate of water consumption in the service area tripling between the mid-1930s and mid-1950s, there had been no additions to the municipal water supply during that time. Creegan & D'Angelo would also serve as the engineers for the Santa Cruz County Flood Control and Water Conservation District Advisory Committee, and ultimately, their recommendation to the council to remedy the current water crisis in the City was a dam on Newell Creek (Santa Cruz Sentinel 1953: 1, 1954: 1, 1958a: 4).

A number of general obligation and revenue bonds helped to fund a wide range of water-related projects in Santa Cruz during this period, including routine maintenance and transmission line replacements, but also projects such as the Graham Hill Treatment Plant (1959), Newell Creek Dam (1960), the Tait Street Diversion (1961) and the Felton Diversion Station (1976). The need for these projects was driven by the need for more water to support a growing, post-war population, but the use of bonds allowed for flexibility to project for future growth. In 1974, the *Santa Cruz Sentinel* surmised that "successful bond issues in 1958, 1963 and in 1967 reflected public confidence in the water administration and a recognition of the needs for more water, apparently, for there was relatively little difficulty getting approval" (Santa Cruz Sentinel 1974: 1–2).

Newell Creek Dam (1960, modified in 1985)
As a surface water storage on Newell Creek became a distinct reality following the recommendations of Creegan and D'Angelo, City Water Department Director, Weston Webber, voiced his support for the project in 1957. Ultimately, of the five proposed dams, only the Newell Creek Dam would come to fruition (Santa Cruz Sentinel 1957a: 1, 1957b: 13, 1957c: 12).

In 1958, the University of California Regents announced that they were considering the Cowell Ranch in the City of Santa Cruz as the site of a future University of California Campus. The City would be required to provide services and facilities for the prospective University community, which early figures suggested was to include around 2,500 students. In anticipation of the Water Revenue Bond Election in November 1958 to approve the bonds necessary to construct the Newell Creek Dam, a new

water treatment plant, and pipelines to transport the water, the Santa Cruz Sentinel published an article outlining the impact of the proposed bonds. In reference to the speculative University in the City, the closing paragraph of the article states that "University officials know that the present water supply of Santa Cruz is inadequate, even for normal needs. Failure to correct this situation could end all chance of the selection of Santa Cruz as the University site." (Santa Cruz Sentinel 1958b: 1, 1961a: 1, 1961b: 1).

On November 5, 1958, the voters of the City of Santa Cruz approved $5.5 million in water revenue bonds necessary for the City to purchase 2,162 acres of land in the Newell Creek watershed from the San Lorenzo Valley Water District and build a dam on the site. Creegan & D'Angelo designed the earthfill dam (SCWD n.d.: 2; Santa Cruz Sentinel 1958a: 4).

Contractors Williams and Burrows Inc. of Belmont, California, began the construction of the Newell Creek Dam and preparation for the creation of Loch Lomond in 1960. The early stages of planning and execution were made more difficult by the narrow valley, allowing only one road for ingress and egress for equipment and supplies. The construction of the 195-foot-tall earthfill dam began with a "grout curtain" that pushed concrete 100 feet into the bedrock to fill any fissures or imperfections, ensuring a structurally sound base. The height and width of the dam's crest was first determined by the reinforced concrete ends. The embankment was then built up using successive layers of random fill from the immediate area, compacted with sheepsfoot tampers above and around the 300 feet of impervious material at the core of the embankment. Four construction personnel lost their lives in October 1960 during the layered construction of the embankment. A brass plaque commemorating these men was commissioned and remains today on the southwest elevation of the Control House (Santa Cruz Sentinel 1960b: 15, 1960e: 1).

The Newell Creek Dam was completed and filling steadily with water by 1961; however, the recreation area on the resulting reservoir was yet to be built. Keeping with the Scottish naming tradition started by Scotsman John Burns when he christened the mountain Ben Lomond in the 1850s, the reservoir was dedicated Loch Lomond during two days of festivities on July 27 and 28, 1963 (Santa Cruz Sentinel 1963: 1).

By 1964, the City distributed a notice to bid on the construction of the Loch Lomond Recreation Development. With the help of a $149,000 state grant, the Loch Lomond Recreation Area was completed by the spring of 1965. It included picnic areas, a concessions building, parking areas, two docks, and a boat launch. An all-weather road leading from Lompico to the Recreation Area was a crucial improvement constructed during this phase of the Project. It allowed visitors to experience the new recreation activities available at Loch Lomond, while simultaneously comprehending the realities of water storage and use in the county (Santa Cruz Sentinel 1964: 3).

Development of the Newell Creek Pipeline (1961)

Planning for the NCP began in conjunction with the development of the Newell Creek Dam and the GHWTP following the approval of $5.5 million in water revenue bonds by Santa Cruz voters in November 1958. The City selected Brown and Caldwell Civil and Chemical Engineers (Brown and Caldwell) to design the NCP and select the alignment of the proposed structure intended to carry reserved water from the Loch Lomond Reservoir to the GHWTP. Although the NCP was planned to work in tandem with the planned Newell Creek Dam system, Brown and Caldwell were not responsible for planning and design of the Newell Creek Dam and its associated components. Brown and Caldwell were, however, also responsible for the design of the GHWTP, which was completed in 1959 (SCWD n.d.: 2; Santa Cruz Sentinel 1958a: 4).

In October 1959, the City received a ROW agreement from the State of California for approximately 15,000 feet of the NCP to pass through the newly formed Henry Cowell Redwoods State Park south of Felton. The ROW agreement included the stipulation that the City would fund the construction of a graded maintenance road alongside the NCP (today known as Pipeline Road), including the installation of wharf hydrants supplied by the state along the route. The ROW agreement also stipulated that the NCP project would supply the park with untreated water in anticipation of a campground being planned on the southern area of the park. Brown and Caldwell began a survey of this area in late 1959 to determine the most strategic alignment of the NCP, which would be decided based on the existing terrain of the Henry Cowell Redwood State Park (Santa Cruz Sentinel 1959: 7).

The segments of the NCP directly north of Felton were planned along a section of the former Felton and Pescadero Railroad bed that was decommissioned in 1934. This section of the former railroad path heads northwest from Henry Cowell Redwoods State Park where the tracks met the former Santa Cruz and Felton Railroad tracks, beneath Zayante Creek, and diagonally across Graham Hill Road and Mt. Herman Road to the beginning of San Lorenzo Way from whence the NCP traveled northwest. This section of road includes multiple culverts which dated to the construction of the railroad in 1885.

The City requested bids for the construction of the NCP in April 1960. The notice to bidders specified "the construction of approximately 3,700 feet of 27-inch, 44,000 feet of 22-inch, 8,797 feet of 20-inch, and 1,151 feet of 18-inch pipelines with appurtenances; and of approximately 15,000 feet of access road with culverts and other necessary appurtenances" (Santa Cruz Sentinel 1960a: 18). The bid was awarded to the Granite Construction Company of Watsonville. Clearing work for the NCP path began in June 1960, and construction of the NCP began in July 1960 at the GHWTP, which was also designed by Brown and Caldwell and completed in 1959. From there, the NCP extended north along Graham Hill Road (Figure 11) before ducking into Henry Cowell Redwood Park at Simms Road. The various widths of the 9.25-mile pipeline used for the project were a concrete cylinder pipe material, which is composed of a steel cylinder lined with cement mortar on the interior and is wrapped with a mild wire and coated with dense cement mortar. The NCP was completed later in 1960 (Santa Cruz Sentinel 1960a: 18, 1960c: 14, 1960d: 5)

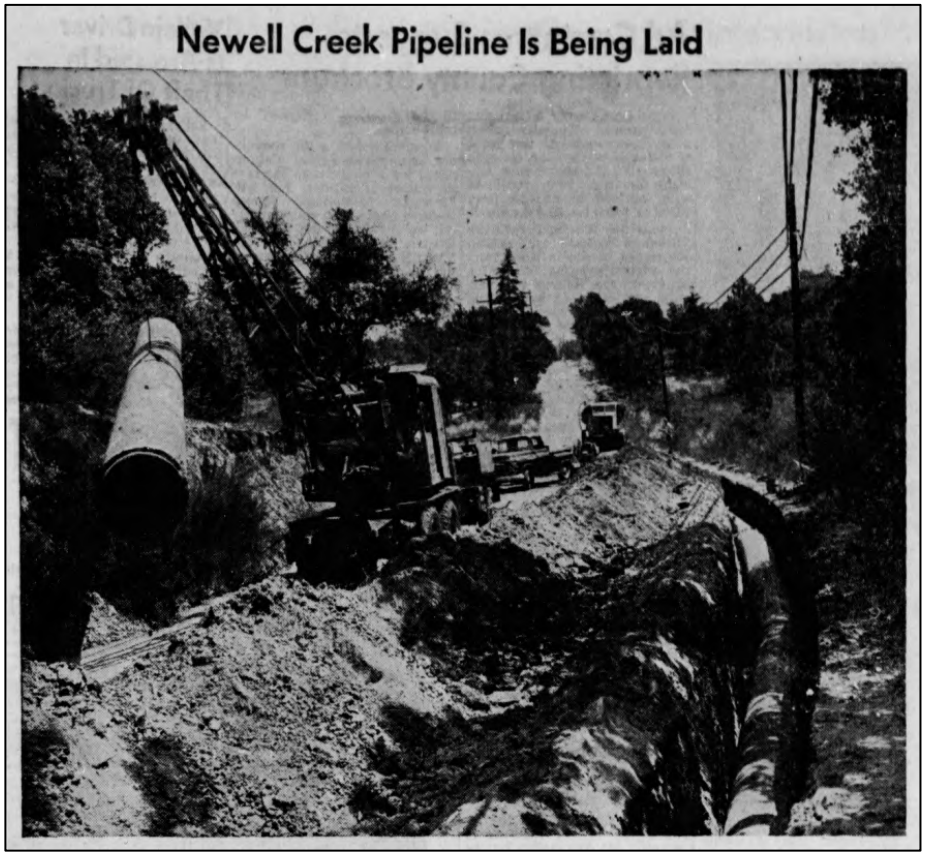


Figure 11. A photograph of the Newell Creek Pipeline being laid along Graham Hill Road in July 1960 (Santa Cruz Sentinel 1960d: 5).

In January 1968, the City completed construction of a supplemental pipeline in the Henry Cowell Redwood State Park to distribute water to the public campground being completed in the southern section of the park. The construction of the 8-inch pipe was an obligation stipulated by the state in exchange for the 1958 ROW through the park (Santa Cruz Sentinel 1967: 2).

In January of 1982, a powerful storm caused a major landslide in the Brackney section of the NCP, which caused the disruption of the service for several weeks. The NCP was promptly repaired, but the incident renewed community attention to the potential for the aging components of the municipal system to require upfront repair and maintenance, which prompted community support for funding measures to update and modernize other major infrastructure elements beginning in 1984. In 2017, the Brackney section was again subject to damage caused by heavy rains and land slide activity. In 2020, the northern-most segment of section of the NCP between the Newell Creek Dam and the southern end of the Newell Creek Access Bridge was replaced as part of the Newell Creek Dam Inlet/Outlet Replacement Project (Santa Cruz Sentinel 1982: 1, 8, 1984: 3, 1985: 11; Cardona and Associates 1982; SCWD n.d.: 2).

Engineers: Brown and Caldwell Civil and Chemical Consulting Engineers (1947-Present)

Engineers Kenneth Brown and David Caldwell founded Brown and Caldwell Civil and Chemical Engineers in 1947 in San Francisco, California. The firm specialized in surveys and consultation related to water supply management and treatment, and also in the design of sewer and water treatment infrastructure, water and sewage treatment plants, and delivery pipelines.
The firm is presently still in operation and continues to provide a wide selection of services related to "Safeguarding Water, maintaining infrastructure and restoring habitats" (Brown and Caldwell 2021).

A representative selection of projects completed by Brown and Caldwell is presented below (Colfax Record 1949: 4; Napa Journal 1949: 7; Press Democrat 1951: 1; Ukiah Daily Journal 1957: 9; Daily Independent Journal 1958: 11; Sacramento Bee 1960: 18):

- Auburn Domestic Water Treatment Plant (consulting engineers), Auburn, California (1949)
- Conn Water System Investigation (consulting engineers), Napa County, California (1949)
- Santa Rosa Sewer Plant (consulting and designing engineers), Santa Rosa, California (1951)
- Ukiah Treatment Plant (designing engineers), Ukiah, California (1957)
- South Tahoe Public Utility District Sewage Treatment Plant (consulting engineers), South Lake Tahoe, California (1960)

Contractors: Granite Construction (1900-Present)

During the mid-to-late nineteenth century, the simultaneous development of railroads across the United States caused the demand for granite stone to increase steadily as it was considered integral to the installation of tracks, which helped to level the railroad tracks and evenly distribute the weight of passing trains. Following the discovery of a granite quarry on James Harvey Logan's ranch property outside of Watsonville, California, John T. Porter, his son, Warren Porter, and A.R. Wilson saw it as a financial opportunity and purchased the quarry from Logan for $10,000. Together they established the Granite Rock Company in 1900 (Granite Construction 2021).

The devastation wrought by the 1906 earthquake presented a unique opportunity for the young company, which found that granite was now in heavy demand as a building material. New laws encouraging the surfacing of roads and sidewalks between 1907 and 1910 prompted further growth, and by 1909, the Granite Rock Company employed 110 men. The onset of World War I, however, quickly presented setbacks as 20% of the nation's production was allocated to wartime needs. The company weathered World War I through the implementation of storehouses along the rail lines to meet the demand for more minor projects (Granite Construction 2021).

The economically slow period prompted the company to restructure following the end of the war and begin branching out into the construction aspect of the trade instead of simply the material supply. The company formed the Granite Construction Company in 1922, which was a subsidiary devoted to the construction arm of the business headed by Walter J. Wilkinson. Although the Great Depression tested the company, the prosperous period following World War II resulted in unprecedented growth for the company. Granite expanded outwards from Watsonville, establishing branch offices in Monterey, California, in 1945 and Santa Cruz, California, in 1946. The company continued to expand during the second half of the twentieth century, moving into new construction ventures including major highways,

dams, water infrastructure, and rapid transit stations in California, but gradually in Texas, Florida, New York, and Washington D.C. Today, the company operates as a diversified company incorporating both the construction and construction material aspects of projects encompassing transportation and water infrastructure (Granite Construction 2021).

A representative selection of projects completed by Granite Construction is presented below (Granite Construction 2021):

- Carnegie Library, Watsonville, California (1903)
- Santa Cruz Courthouse Annex (1907–1910)
- Monterey Odd Fellows Building (1907–1910)
- Road to Glacier Point, Yosemite National Park, California (1936)
- Surfacing of Highway 99 near Elk Grove, California (1955)
- Interstate 80 between San Francisco and Squaw Valley, California (1957)
- Donner Pass, Nevada County, California (1965)
- Rollins Dam, Nevada and Placer counties (1965)
- Portion of the California Aqueduct (1965)
- Powel Street Station, San Francisco, California (1972)
- San Joaquin Toll Road (CA-73), Orange County, California (1996)

NRHP/CRHR Statement of Significance

NRHP Criterion A: associated with events that have made a significant contribution to the broad patterns of our history
CRHR Criterion 1: is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
Water delivery infrastructure such as water pipelines that are associated with the regional water supply are a common property type throughout the County, the State of California, and the nation. Components of water storage and delivery systems have been considered significant under NRHP Criterion A and CRHR Criterion 1 when they were associated with events that have made a significant contribution to the broad patterns of our history, such as early advances in water management. Outside of early examples of water management projects, unless the implementation of a water management project can be demonstrated to have contributed significantly to the unique history of the County, state, or nation, development which supports general growth is far too common an association to merit a blanket conclusion of historical significance under NRHP Criterion A or CRHR Criterion 1 within the context of water management systems. The Newell Creek Dam is directly associated with important events that have made a significant contribution to the development of water infrastructure development in Santa Cruz. These important events include concerns over local water shortages in the late 1950s (as documented in state and local water supply reports) leading up to the passage of the Water Revenue Bond in 1958, which approved funding for construction of the Newell Creek Dam in direct response to concerns over water shortages. Archival research also revealed that water shortages in the late 1950s threatened to make Santa Cruz a less than desirable choice for the location of the next University of California, noting that failure to correct water shortage issues could end all chance of the selection of Santa Cruz as the University site. Construction of the Newell Creek Dam gave the City control over the seasonal fluctuations in water availability and became a critical component to the water infrastructure, which supported the sustained growth of the City after World War II (Dudek 2018).

While the NCP was planned simultaneously with the Newell Creek Dam during the late 1950s, the structures were planned by separate engineering companies and constructed by different contractors to work in conjunction with each other as part of the overall, interconnected municipal system. The NCP constitutes a ubiquitous, mid-twentieth century addition to the City's existing water system distribution system, and therefore is associated with the period of pervasive expansion which characterized the water systems throughout the nation, state, and County following the end of World War II. As such, this structure is not a physical example of the early water delivery efforts in the County, of which there are extant examples such as the Laguna Creek Dam, nor can it be singularly tied to any one event that has made a significant contribution to the development of the City of Santa Cruz, the County, or the state, as in the case of the Newell Creek Dam.

The NCP, as an expansion of the existing water system, is not associated with any events occurring within the context of County water development that would distinguish the structure from the vast array of water management systems dotting the California landscape. Moreover, research into the history of the NCP revealed no evidence suggesting that the structures are associated with an alternative, more unique event or pattern of events considered historically significant. For these reasons, the subject property does not appear eligible under NRHP Criterion A or CRHR Criterion 1.

NRHP Criterion B: associated with the lives of significant persons in our past.
CRHR Criterion 2: is associated with the lives of persons important in our past.
To be found eligible under Criterion B/2 the property has to be directly tied to an important person and the place where that individual conducted or produced the work for which he or she is known. Archival research failed to indicate any such direct association between individuals that are known to be historic figures at the national, state, or local level and the NCP. The NCP represents the collective efforts of many individuals, rather than the work of any single individual. Therefore, the NCP is not known to have any historical associations with people important to the nation's or state's past. Due to a lack of identified significant associations with important persons in history, the subject property does not appear eligible under NRHP Criterion B or CRHR Criterion 2.

NRHP Criterion C: embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.
CRHR Criterion 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.
Overall, the NCP demonstrates simple pipeline construction methods that have been in place regionally since the 1860s. As such, the NCP lacks sufficient distinction to be called significant within any particular water delivery infrastructure type. The NCP was completed in 1960; however, major damage in ensuing years required subsequent alterations, including emergency flood damage repairs in 1983 and 2017, as well as minor realignments and repairs to address leaks and breakages as they arose along the route of the pipeline. These alterations have caused the NCP to retain only diminished integrity of materials and workmanship.

The NCP was planned and designed by Brown and Caldwell Civil and Chemical Engineers of San Francisco, who specialized in the planning and implementation of water delivery and treatment systems. Brown and Caldwell helped to design and implement similar facilities throughout California during the period the NCP was designed and built, and they were also the designers of the GHWTP, which was recommended not eligible for listing in the NRHP, CRHR, and the SCCHRI in 2018. There is no indication that Brown and Caldwell reached the level of notoriety to be considered a masters in the field of engineering, nor does it appear that the NCP is representative of any new advancements or techniques in the field of engineering that were developed by Brown and Caldwell. Overall, the design for the NCP does not appear to be distinctive or innovative. It also does not constitute the first, last or only example of a pipeline designed by Brown and Caldwell for this purpose during the course of their careers.

The Granite Construction Company served as the contractors for the project. In consideration of the firm's work on highly publicized, important projects, such as the construction of the first roads into Yosemite National Park during the 1930s and the California Aqueduct during the 1960s, the NCP cannot be said to qualify as the most representative example of the firm's work overall or even during this period.

Overall, the NCP lacks sufficient engineering distinction to be significant within any particular water delivery and management infrastructure type. Consequently, the subject property does not appear eligible under NRHP Criterion C or CRHR Criterion 3.

NRHP Criterion D: have yielded, or may be likely to yield, information important in history or prehistory.
CRHR Criterion 4: has yielded, or may be likely to yield, information important in prehistory or history.
There is no evidence to indicate that the subject property is likely to yield any additional

information important to prehistory or history beyond what is already known. The subject property is also not associated with an archaeological site or a known subsurface cultural component. Therefore, the subject property does not appear eligible under NRHP Criterion D or CRHP Criterion 4.

SCCHRI Statement of Significance

1. The resource is associated with a person of local, State or national historical significance.
As stated in NRHP/CRHR Criterion B/2, archival research did not reveal an association between the NCP and any persons who significantly contributed to the development of the City, state, or nation. Therefore, the facility does not appear eligible under County Criterion 1.

2. The resource is associated with an historic event or thematic activity of local, State or national importance.
As stated in NRHP/CRHR Criterion A/1, the NCP is not associated with any extraordinary event or events occurring within the context of County water development that would distinguish the structure from the vast array of water management systems dotting the California landscape. Moreover, research into the history of the NCP revealed no evidence suggesting that the structures are associated with an alternative, more unique event or pattern of events considered historically significant. For these reasons, the NCP does not appear to be directly associated with events that have made a significant contribution to the development of water infrastructure in the County. Therefore, the subject property does not appear eligible under County Criterion 2.

3. The resource is representative of a distinct architectural style and/or construction method of a particular historic period or way of life, or the resource represents the work of a master builder or architect or possesses high artistic values.
As discussed in NRHP/CRHR Criterion C/3, the NCP has experienced multiple alterations over time in response to required repairs and modern equipment installation to ensure ongoing use. It is representative of simple earthen mid-century pipeline construction methods and lacks sufficient distinction to be considered significant. The structure is also not associated with the work of a master engineer or master builder and does not possess high artistic values. Therefore, the subject property does not appear eligible under County Criterion 3.

4. The resource has yielded, or may likely yield, information important to history.
As discussed under NRHP/CRHR Criterion D/4, there is no evidence to indicate that the NCP is likely to yield any additional information important to prehistory or history beyond what is already known. The NCP is also not associated with an archaeological site or a known subsurface cultural component. Therefore, the subject property does not appear eligible under County Criterion 4.

Integrity Discussion
In addition to meeting one or more of the above criteria, an eligible resource must retain integrity, which is expressed in seven aspects: location, design, setting, workmanship, materials, feeling, and association. All properties change over the course of time. Consequently, it is not necessary for a property to retain all its historic physical features or characteristics. However, the property must retain the essential physical features that enable it to convey its historic identity. The essential physical features are those features that define both why a property is significant and when it was significant.

The NCP retains its historic alignment, original length, and continues to function as a water pipeline. As such, the NCP retains integrity of location, design, and association. The setting surrounding the NCP has been altered through dense residential and commercial development since 1960 when the structure was completed. As a result, the NCP retains only diminished integrity of setting and feeling. In addition to large repairs to sections of the NCP in 1982 and 2017, the NCP has been periodically maintained, which has resulted in the replacement of original materials including associated appurtenances. Due to this, the NCP no longer retains integrity of materials and workmanship. Additionally, as previously mentioned, the northern 2,000 feet of the NCP is being replaced as part of the Newell Creek Dam Inlet/Outlet Replacement Project that is currently under construction.

Summary of Evaluation Findings

The segment of the NCP was evaluated for listing in the NRHP, the CRHR, or the SCCHRI and was found ineligible under all Criteria. As such, the NCP does not appear to be a historic property under Section 106 of the NHPA or a historical resource under CEQA.

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Appendix D

Noise Modeling Outputs

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Appendix D - 1

Traffic Noise Model Calculations

Project: 12287 SCWD - Newell Creek Pipeline

Noise Level Descriptor: Ldn
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor: 10

	Segment Description and Location			Input										Output				
						Distance to Directional Centerline, (feet)$_4$		Traffic Distribution Characteristics					Ldn,	Distance to Contour, (feet)$_3$				
Number	Name	From	To	ADT	Speed (mph)	Near	Far	% Auto	% Med	% Hvy	% Day	% Night	(dBA)$_{5,6,7}$	70 dBA	65 dBA	60 dBA	55 dBA
Existing Conditions																		
1	GRAHAM HILL RD	HWY 9	MT HERMON Rd	27,896	35	100	100	97.0%	2.0%	1.0%	80.0%	20.0%	65.4	49	107	230	495
2	GRAHAM HILL RD	MT HERMON Rd	LOCKWOOD LN	6,749	35	100	100	97.0%	2.0%	1.0%	80.0%	20.0%	59.3	19	41	89	192
3	GLEN ARBOR RD	HWY 9	GLEN ARBOR RD	4,337	30	100	100	99.0%	1.0%	0.0%	80.0%	20.0%	54.5	9	20	43	93
4	SR 9	GRAHAM HILL	GLEN ARBOR RD	21,727	35	100	100	97.0%	2.0%	1.0%	80.0%	20.0%	64.3	42	90	194	419

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Appendix D

Project-Generated Construction Source Noise Prediction Model

Newell Creek Pipeline Project - Conventional Open-Cut Trenching

Pipeline - Road Removal/Pipe Installation

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold*	470	60.0
	124	75.0
	100	77.4
	150	72.8
	200	69.6
	250	67.1
	300	65.1
	350	63.3
	400	61.8
	450	60.5
	500	59.3
	550	58.3

Equipment Assumptions	Qty.	Reference Emission Noise Levels (Lmax) at 50 feet[1]	Usage Factor[1]
Excavator	**1**	85	0.4
Tractor	**1**	84	0.4
Tractor	**1**	84	0.4

Ground Type	Soft
Source Height	5
Receiver Height	5
Ground Factor	0.58

Predicted Noise Level[2]	L_{eq} dBA at 50 feet[2]
Excavator	81.0
Tractor	80.0
Tractor	80.0

Predicted Combined Noise Level (L_{eq} dBA at 50 feet)
85.2

Sources:

1 - Obtained from the FHWA Roadway Construction Noise Model, January 2006.

2 - Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Appendix E

Air Quality and Greenhouse Gas Emissions Calculations

This technical appendix is available to view on the City's website at:
http://www.cityofsantacruz.com/waterenvdocs

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Air Quality and Greenhouse Gas Emissions Calculations

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Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Newell Creek Pipeline Construction - Near Term

Santa Cruz County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	10.70	Acre	10.70	466,092.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	1.8	**Precipitation Freq (Days)**	61
Climate Zone	5			**Operational Year**	2032
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Area to be paved conservatively based on total length (linear feet) of pipelines by 20 feet width (near term construction)

Construction Phase - Schedule based on SCWD input

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Off-road Equipment - Based on input from SCWD

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Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Trips and VMT - Based on input from SCWD

Grading - Based on input from SCWD

Architectural Coating - Default

Vehicle Trips - Modeling construction only

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

On-road Fugitive Dust - Default

Area Coating - Modeling construction only

Construction Off-road Equipment Mitigation - Water exposed areas 2x per day

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	300.00	15.00
tblConstructionPhase	NumDays	300.00	10.00
tblConstructionPhase	NumDays	300.00	15.00
tblConstructionPhase	NumDays	300.00	15.00
tblConstructionPhase	NumDays	300.00	5.00
tblConstructionPhase	NumDays	30.00	5.00
tblConstructionPhase	NumDays	30.00	15.00
tblConstructionPhase	NumDays	30.00	132.00
tblConstructionPhase	NumDays	30.00	60.00
tblConstructionPhase	NumDays	30.00	40.00
tblConstructionPhase	NumDays	20.00	1.00
tblConstructionPhase	NumDays	20.00	1.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	10.00	25.00
tblConstructionPhase	NumDays	10.00	20.00
tblConstructionPhase	NumDays	10.00	25.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstructionPhase	NumDays	10.00	34.00
tblConstructionPhase	NumDays	30.00	5.00
tblConstructionPhase	NumDays	30.00	59.00
tblConstructionPhase	NumDays	30.00	59.00
tblGrading	AcresOfGrading	0.00	0.09
tblGrading	AcresOfGrading	0.00	0.34
tblGrading	AcresOfGrading	0.00	8.90
tblGrading	AcresOfGrading	0.00	1.37
tblGrading	MaterialExported	0.00	3,038.00
tblGrading	MaterialExported	0.00	9,113.00
tblGrading	MaterialExported	0.00	26,730.00
tblGrading	MaterialExported	0.00	24,300.00
tblGrading	MaterialExported	0.00	849.00
tblGrading	MaterialExported	0.00	849.00
tblGrading	MaterialExported	0.00	233.00
tblOffRoadEquipment	HorsePower	130.00	75.00
tblOffRoadEquipment	HorsePower	130.00	75.00
tblOffRoadEquipment	HorsePower	130.00	75.00
tblOffRoadEquipment	HorsePower	130.00	75.00
tblOffRoadEquipment	HorsePower	80.00	170.00
tblOffRoadEquipment	HorsePower	80.00	170.00
tblOffRoadEquipment	HorsePower	80.00	170.00
tblOffRoadEquipment	HorsePower	80.00	170.00
tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	65.00	80.00
tblOffRoadEquipment	HorsePower	65.00	80.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	HorsePower	65.00	80.00
tblOffRoadEquipment	HorsePower	65.00	80.00
tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	PhaseName		Big Trees RR Crossing: Backfill
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Tie in to FBPS
tblOffRoadEquipment	PhaseName		Big Trees RR Crossing: Boring and casing
tblOffRoadEquipment	PhaseName		Zayante Creek Crossing: CIDH Piles
tblOffRoadEquipment	PhaseName		Big Trees RR Crossing: Grout
tblOffRoadEquipment	PhaseName		Zayante Creek Crossing: CIDH Piles
tblOffRoadEquipment	PhaseName		Zayante Creek Crossing: Pipe support
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Outside Henry Cowell
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Inside Henry Cowell
tblOffRoadEquipment	PhaseName		Zayante Creek Crossing: Pipe support
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	PhaseName		Big Trees RR Crossing: Shaft excavation
tblOffRoadEquipment	PhaseName		Zayante Creek Crossing: Pier scour protect
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Paving
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Paving
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Outside Henry Cowell
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Inside Henry Cowell
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Paving
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Pressure test

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	PhaseName		GH Rd South: Test pipeline
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Paving
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Pavement striping
tblOffRoadEquipment	PhaseName		GH Rd South: Cathodic protection
tblOffRoadEquipment	PhaseName		Big Trees RR Crossing: Pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Paving
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Paving
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Paving
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: GHWTP tie in
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Outside Henry Cowell
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Inside Henry Cowell

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	3.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	3.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	3.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	3.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	50.00
tblTripsAndVMT	HaulingTripNumber	0.00	80.00
tblTripsAndVMT	HaulingTripNumber	0.00	40.00
tblTripsAndVMT	HaulingTripNumber	29.00	33.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	HaulingTripNumber	0.00	18.00
tblTripsAndVMT	HaulingTripNumber	0.00	63.00
tblTripsAndVMT	HaulingTripNumber	0.00	30.00
tblTripsAndVMT	HaulingTripNumber	0.00	50.00
tblTripsAndVMT	HaulingTripNumber	380.00	0.00
tblTripsAndVMT	HaulingTripNumber	0.00	812.00
tblTripsAndVMT	HaulingTripNumber	1,139.00	2,437.00
tblTripsAndVMT	HaulingTripNumber	3,341.00	7,148.00
tblTripsAndVMT	HaulingTripNumber	0.00	45.00
tblTripsAndVMT	HaulingTripNumber	0.00	67.00
tblTripsAndVMT	HaulingTripNumber	0.00	449.00
tblTripsAndVMT	HaulingTripNumber	106.00	133.00
tblTripsAndVMT	HaulingTripNumber	3,038.00	6,498.00
tblTripsAndVMT	HaulingTripNumber	0.00	449.00
tblTripsAndVMT	HaulingTripNumber	0.00	173.00
tblTripsAndVMT	HaulingTripNumber	0.00	404.00
tblTripsAndVMT	HaulingTripNumber	106.00	133.00
tblTripsAndVMT	HaulingTripNumber	0.00	17.00
tblTripsAndVMT	HaulingTripNumber	0.00	23.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	HaulingTripNumber	0.00	260.00
tblTripsAndVMT	HaulingTripNumber	0.00	64.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	12.00
tblTripsAndVMT	VendorTripNumber	0.00	12.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	76.00	4.00
tblTripsAndVMT	VendorTripNumber	76.00	6.00
tblTripsAndVMT	VendorTripNumber	76.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	76.00	2.00
tblTripsAndVMT	VendorTripNumber	76.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	58.00
tblTripsAndVMT	VendorTripNumber	0.00	85.00
tblTripsAndVMT	VendorTripNumber	0.00	78.00
tblTripsAndVMT	VendorTripNumber	0.00	50.00
tblTripsAndVMT	VendorTripNumber	0.00	72.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	50.00
tblTripsAndVMT	VendorTripNumber	0.00	16.00
tblTripsAndVMT	VendorTripNumber	0.00	112.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	93.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	14.00
tblTripsAndVMT	VendorTripNumber	0.00	14.00
tblTripsAndVMT	VendorTripNumber	0.00	16.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	16.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	12.00
tblTripsAndVMT	WorkerTripNumber	8.00	16.00
tblTripsAndVMT	WorkerTripNumber	18.00	16.00
tblTripsAndVMT	WorkerTripNumber	10.00	20.00
tblTripsAndVMT	WorkerTripNumber	5.00	4.00
tblTripsAndVMT	WorkerTripNumber	3.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	2.00
tblTripsAndVMT	WorkerTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	196.00	8.00
tblTripsAndVMT	WorkerTripNumber	196.00	6.00
tblTripsAndVMT	WorkerTripNumber	196.00	8.00
tblTripsAndVMT	WorkerTripNumber	8.00	16.00
tblTripsAndVMT	WorkerTripNumber	196.00	2.00
tblTripsAndVMT	WorkerTripNumber	196.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	6.00
tblTripsAndVMT	WorkerTripNumber	28.00	32.00
tblTripsAndVMT	WorkerTripNumber	28.00	36.00
tblTripsAndVMT	WorkerTripNumber	28.00	34.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	WorkerTripNumber	18.00	22.00
tblTripsAndVMT	WorkerTripNumber	18.00	22.00
tblTripsAndVMT	WorkerTripNumber	3.00	4.00
tblTripsAndVMT	WorkerTripNumber	18.00	22.00
tblTripsAndVMT	WorkerTripNumber	30.00	16.00
tblTripsAndVMT	WorkerTripNumber	28.00	34.00
tblTripsAndVMT	WorkerTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	4.00
tblTripsAndVMT	WorkerTripNumber	18.00	22.00
tblTripsAndVMT	WorkerTripNumber	3.00	2.00
tblTripsAndVMT	WorkerTripNumber	39.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	2.00
tblTripsAndVMT	WorkerTripNumber	8.00	6.00
tblTripsAndVMT	WorkerTripNumber	8.00	6.00
tblTripsAndVMT	WorkerTripNumber	30.00	16.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	45.00	16.00
tblTripsAndVMT	WorkerTripNumber	13.00	16.00
tblTripsAndVMT	WorkerTripNumber	5.00	6.00
tblTripsAndVMT	WorkerTripNumber	18.00	16.00

2.0 Emissions Summary

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	10.7507	96.4816	133.5422	0.2498	10.0861	4.6663	14.1586	2.5080	4.4943	6.4409	0.0000	24,076.1033	24,076.1033	4.5981	0.2852	24,242.5844
2023	1.7633	41.2514	21.1343	0.1409	4.1532	0.6855	4.6008	1.1324	0.6663	1.5568	0.0000	15,081.3424	15,081.3424	0.8290	2.0847	15,719.4905
2024	39.5665	47.1384	21.3026	0.1602	4.4605	0.6021	5.0627	1.2195	0.5667	1.7861	0.0000	17,098.0697	17,098.0697	0.9468	2.3121	17,810.7494
2025	0.2012	3.8443	1.5015	0.0125	0.3625	0.0529	0.4154	0.0997	0.0515	0.1512	0.0000	1,310.0308	1,310.0308	0.0537	0.1759	1,363.7919
Maximum	**39.5665**	**96.4816**	**133.5422**	**0.2498**	**10.0861**	**4.6663**	**14.1586**	**2.5080**	**4.4943**	**6.4409**	**0.0000**	**24,076.1033**	**24,076.1033**	**4.5981**	**2.3121**	**24,242.5844**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	10.7507	96.4816	133.5422	0.2498	10.0847	4.6663	14.1573	2.5078	4.4943	6.4407	0.0000	24,076.1033	24,076.1033	4.5981	0.2852	24,242.5843
2023	1.7633	41.2514	21.1343	0.1409	4.1188	0.6855	4.5665	1.1276	0.6663	1.5521	0.0000	15,081.3424	15,081.3424	0.8290	2.0847	15,719.4905
2024	39.5665	47.1384	21.3026	0.1602	4.4278	0.6021	5.0299	1.2151	0.5667	1.7817	0.0000	17,098.0697	17,098.0697	0.9468	2.3121	17,810.7494
2025	0.2012	3.8443	1.5015	0.0125	0.3625	0.0529	0.4154	0.0997	0.0515	0.1512	0.0000	1,310.0308	1,310.0308	0.0537	0.1759	1,363.7919
Maximum	**39.5665**	**96.4816**	**133.5422**	**0.2498**	**10.0847**	**4.6663**	**14.1573**	**2.5078**	**4.4943**	**6.4407**	**0.0000**	**24,076.1033**	**24,076.1033**	**4.5981**	**2.3121**	**24,242.5843**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.36**	**0.00**	**0.28**	**0.19**	**0.00**	**0.09**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1652	1.0000e-005	1.0900e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.3400e-003	2.3400e-003	1.0000e-005		2.4900e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1652**	**1.0000e-005**	**1.0900e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.3400e-003**	**2.3400e-003**	**1.0000e-005**	**0.0000**	**2.4900e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1652	1.0000e-005	1.0900e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.3400e-003	2.3400e-003	1.0000e-005		2.4900e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1652**	**1.0000e-005**	**1.0900e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.3400e-003**	**2.3400e-003**	**1.0000e-005**	**0.0000**	**2.4900e-003**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Brackney North: Mobilization (South HDD pit)	Site Preparation	8/22/2022	9/23/2022	5	25	
2	Brackney North: Mobilization (North HDD pit)	Site Preparation	8/22/2022	9/23/2022	5	25	
3	Brackney North: HDD (South entry)	Grading	9/21/2022	12/12/2022	5	59	
4	Brackney North: HDD (North entry)	Grading	9/21/2022	12/12/2022	5	59	
5	Brackney North: Carrier pipeline staging area prep	Site Preparation	10/28/2022	12/14/2022	5	34	
6	Brackney North: HDD (pullback)	Trenching	12/15/2022	12/16/2022	5	2	
7	Brackney North: Tie-in pipeline construction	Trenching	12/22/2022	1/26/2023	5	26	
8	NCP FBPS to Graham Hill WTP: Staging area	Grading	1/12/2023	4/6/2023	5	40	
9	Brackney North: Abandon existing pipeline	Trenching	1/27/2023	2/3/2023	5	6	
10	Brackney North: Restoration	Site Preparation	2/6/2023	3/3/2023	5	20	
11	Brackney North: Demobilization	Site Preparation	3/6/2023	3/17/2023	5	10	
12	Big Trees RR Crossing: Shaft excavation	Grading	4/7/2023	4/13/2023	5	5	
13	Big Trees RR Crossing: Boring and casing	Trenching	4/14/2023	4/27/2023	5	10	
14	Big Trees RR Crossing: Pipe install	Trenching	4/28/2023	5/4/2023	5	5	
15	Big Trees RR Crossing: Grout	Trenching	5/5/2023	5/11/2023	5	5	
16	Big Trees RR Crossing: Backfill	Trenching	5/12/2023	5/18/2023	5	5	
17	Zayante Creek Crossing: CIDH Piles	Building Construction	8/1/2023	8/14/2023	5	15	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

18	Zayante Creek Crossing: Pier scour protect	Building Construction	8/15/2023	8/23/2023	5	10	
19	Zayante Creek Crossing: Pipe support	Building Construction	8/29/2023	9/19/2023	5	15	
20	Zayante Creek Crossing: Install pipe span	Building Construction	9/20/2023	10/10/2023	5	15	
21	Zayante Creek Crossing: Install flex connect	Building Construction	10/11/2023	10/17/2023	5	5	
22	Zayante Creek Crossing: Grade for drainage	Grading	10/18/2023	10/24/2023	5	5	
23	FBPS to Zayante: Road removal/pipe install	Grading	10/18/2023	11/7/2023	5	15	
24	Zayante to Big Trees RR: Road removal/pipe install	Grading	10/25/2023	12/7/2023	5	30	
25	GH Rd North: Road removal/pipe install	Grading	1/9/2024	5/23/2024	5	132	
26	FBPS to Zayante: Paving	Paving	4/16/2024	4/16/2024	5	1	
27	Zayante to Big Trees RR: Paving	Paving	4/17/2024	4/17/2024	5	1	
28	GH Rd North: Pressure test	Trenching	7/17/2024	7/23/2024	5	5	
29	GH Rd North: Paving	Paving	7/17/2024	7/30/2024	5	10	
30	GH Rd South: Road removal/pipe install	Grading	7/24/2024	10/16/2024	5	60	
31	GH Rd North: Tie in to FBPS	Trenching	7/24/2024	7/30/2024	5	5	
32	GH Rd South: Test pipeline	Trenching	10/17/2024	10/24/2024	5	5	
33	GH Rd South: Paving	Paving	10/17/2024	10/23/2024	5	5	
34	GH Rd South: GHWTP tie in	Trenching	10/24/2024	10/25/2024	5	2	
35	GH Rd South: Pavement striping	Architectural Coating	10/24/2024	10/30/2024	5	5	
36	GH Rd South: Cathodic protection	Trenching	10/27/2024	11/8/2024	5	10	
37	Abandon Existing NCP: Outside Henry Cowell	Trenching	12/11/2024	1/2/2025	5	15	
38	Abandon Existing NCP: Inside Henry Cowell	Trenching	1/3/2025	2/21/2025	5	35	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 10.7

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 27,966 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Brackney North: Mobilization (South HDD pit)	Excavators	1	8.00	158	0.38
Brackney North: Mobilization (South HDD pit)	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: Mobilization (South HDD pit)	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Brackney North: Mobilization (South HDD pit)	Dumpers/Tenders	1	8.00	16	0.38
Brackney North: Mobilization (North HDD pit)	Excavators	1	8.00	158	0.38
Brackney North: Mobilization (North HDD pit)	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: Mobilization (North HDD pit)	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Brackney North: Mobilization (North HDD pit)	Dumpers/Tenders	1	8.00	16	0.38
Brackney North: HDD (South entry)	Pumps	3	10.00	84	0.74
Brackney North: HDD (South entry)	Excavators	1	10.00	158	0.38
Brackney North: HDD (South entry)	Tractors/Loaders/Backhoes	1	10.00	97	0.37
Brackney North: HDD (South entry)	Bore/Drill Rigs	1	10.00	221	0.50
Brackney North: HDD (South entry)	Other Material Handling Equipment	1	10.00	168	0.40
Brackney North: HDD (South entry)	Forklifts	1	10.00	89	0.20
Brackney North: HDD (South entry)	Generator Sets	3	10.00	84	0.74
Brackney North: HDD (South entry)	Other General Industrial Equipment	1	10.00	88	0.34
Brackney North: HDD (North entry)	Pumps	3	10.00	84	0.74
Brackney North: HDD (North entry)	Excavators	1	10.00	158	0.38
Brackney North: HDD (North entry)	Tractors/Loaders/Backhoes	1	10.00	97	0.37
Brackney North: HDD (North entry)	Bore/Drill Rigs	1	10.00	221	0.50
Brackney North: HDD (North entry)	Other Material Handling Equipment	1	10.00	168	0.40
Brackney North: HDD (North entry)	Forklifts	1	10.00	89	0.20
Brackney North: HDD (North entry)	Generator Sets	3	10.00	84	0.74

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Brackney North: HDD (North entry)	Other General Industrial Equipment	1	10.00	88	0.34
Brackney North: Carrier pipeline staging area prep	Excavators	2	8.00	158	0.38
Brackney North: Carrier pipeline staging area prep	Welders	1	8.00	46	0.45
Brackney North: Carrier pipeline staging area prep	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: Carrier pipeline staging area prep	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Brackney North: HDD (pullback)	Excavators	5	24.00	158	0.38
Brackney North: HDD (pullback)	Bore/Drill Rigs	1	24.00	221	0.50
Brackney North: HDD (pullback)	Other Material Handling Equipment	1	24.00	168	0.40
Brackney North: HDD (pullback)	Pumps	3	24.00	84	0.74
Brackney North: HDD (pullback)	Generator Sets	6	10.00	84	0.74
Brackney North: HDD (pullback)	Other General Industrial Equipment	2	10.00	88	0.34
Brackney North: Tie-in pipeline construction	Pavers	1	8.00	130	0.42
Brackney North: Tie-in pipeline construction	Paving Equipment	1	8.00	132	0.36
Brackney North: Tie-in pipeline construction	Rollers	1	8.00	80	0.38
Brackney North: Tie-in pipeline construction	Welders	1	8.00	46	0.45
Brackney North: Tie-in pipeline construction	Excavators	1	8.00	158	0.38
Brackney North: Abandon existing pipeline	Generator Sets	1	8.00	84	0.74
Brackney North: Abandon existing pipeline	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Brackney North: Abandon existing pipeline	Excavators	1	8.00	158	0.38
Brackney North: Abandon existing pipeline	Cement and Mortar Mixers	2	8.00	9	0.56
Brackney North: Abandon existing pipeline	Pumps	2	8.00	84	0.74
Brackney North: Restoration	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: Restoration	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Brackney North: Restoration	Air Compressors	1	8.00	78	0.48
Brackney North: Restoration	Excavators	2	8.00	158	0.38
Brackney North: Restoration	Rollers	2	8.00	80	0.38

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Brackney North: Demobilization	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: Demobilization	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Brackney North: Demobilization	Excavators	2	8.00	158	0.38
NCP FBPS to Graham Hill WTP: Staging area	Excavators	0	8.00	158	0.38
NCP FBPS to Graham Hill WTP: Staging area	Graders	0	8.00	187	0.41
NCP FBPS to Graham Hill WTP: Staging area	Rubber Tired Dozers	0	8.00	247	0.40
NCP FBPS to Graham Hill WTP: Staging area	Scrapers	0	8.00	367	0.48
NCP FBPS to Graham Hill WTP: Staging area	Tractors/Loaders/Backhoes	1	8.00	97	0.37
NCP FBPS to Graham Hill WTP: Staging area	Dumpers/Tenders	1	4.00	16	0.38
Big Trees RR Crossing: Shaft excavation	Dumpers/Tenders	1	8.00	16	0.38
Big Trees RR Crossing: Shaft excavation	Excavators	1	8.00	158	0.38
Big Trees RR Crossing: Boring and casing	Bore/Drill Rigs	1	8.00	221	0.50
Big Trees RR Crossing: Pipe install	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Big Trees RR Crossing: Grout	Cement and Mortar Mixers	1	8.00	9	0.56
Big Trees RR Crossing: Backfill	Aerial Lifts	0	1.00	63	0.31
Zayante Creek Crossing: CIDH Piles	Cranes	0	7.00	231	0.29
Zayante Creek Crossing: CIDH Piles	Forklifts	0	8.00	89	0.20
Zayante Creek Crossing: CIDH Piles	Generator Sets	0	8.00	84	0.74
Zayante Creek Crossing: CIDH Piles	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Zayante Creek Crossing: CIDH Piles	Welders	0	8.00	46	0.45
Zayante Creek Crossing: CIDH Piles	Cement and Mortar Mixers	1	8.00	9	0.56
Zayante Creek Crossing: CIDH Piles	Bore/Drill Rigs	1	8.00	221	0.50
Zayante Creek Crossing: Pier scour protect	Cranes	0	7.00	231	0.29
Zayante Creek Crossing: Pier scour protect	Forklifts	0	8.00	89	0.20
Zayante Creek Crossing: Pier scour protect	Generator Sets	0	8.00	84	0.74
Zayante Creek Crossing: Pier scour protect	Tractors/Loaders/Backhoes	0	7.00	97	0.37

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Zayante Creek Crossing: Pier scour protect	Welders	0	8.00	46	0.45
Zayante Creek Crossing: Pier scour protect	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Zayante Creek Crossing: Pier scour protect	Dumpers/Tenders	1	3.00	16	0.38
Zayante Creek Crossing: Pipe support	Cranes	0	7.00	231	0.29
Zayante Creek Crossing: Pipe support	Forklifts	0	8.00	89	0.20
Zayante Creek Crossing: Pipe support	Generator Sets	0	8.00	84	0.74
Zayante Creek Crossing: Pipe support	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Zayante Creek Crossing: Pipe support	Welders	0	8.00	46	0.45
Zayante Creek Crossing: Pipe support	Cement and Mortar Mixers	1	8.00	9	0.56
Zayante Creek Crossing: Pipe support	Concrete/Industrial Saws	1	1.00	81	0.73
Zayante Creek Crossing: Install pipe span	Cranes	1	8.00	231	0.29
Zayante Creek Crossing: Install pipe span	Forklifts	0	8.00	89	0.20
Zayante Creek Crossing: Install pipe span	Generator Sets	0	8.00	84	0.74
Zayante Creek Crossing: Install pipe span	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Zayante Creek Crossing: Install pipe span	Welders	0	8.00	46	0.45
Zayante Creek Crossing: Install flex connect	Cranes	0	7.00	231	0.29
Zayante Creek Crossing: Install flex connect	Forklifts	0	8.00	89	0.20
Zayante Creek Crossing: Install flex connect	Generator Sets	0	8.00	84	0.74
Zayante Creek Crossing: Install flex connect	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Zayante Creek Crossing: Install flex connect	Welders	0	8.00	46	0.45
Zayante Creek Crossing: Grade for drainage	Excavators	0	8.00	158	0.38
Zayante Creek Crossing: Grade for drainage	Graders	0	8.00	187	0.41
Zayante Creek Crossing: Grade for drainage	Rubber Tired Dozers	0	8.00	247	0.40
Zayante Creek Crossing: Grade for drainage	Scrapers	0	8.00	367	0.48
Zayante Creek Crossing: Grade for drainage	Tractors/Loaders/Backhoes	1	8.00	97	0.37

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

FBPS to Zayante: Road removal/pipe install	Air Compressors	0	1.00	78	0.48
FBPS to Zayante: Road removal/pipe install	Excavators	1	1.00	158	0.38
FBPS to Zayante: Road removal/pipe install	Tractors/Loaders/Backhoes	1	1.00	97	0.37
FBPS to Zayante: Road removal/pipe install	Graders	0	8.00	187	0.41
FBPS to Zayante: Road removal/pipe install	Concrete/Industrial Saws	1	1.00	81	0.73
FBPS to Zayante: Road removal/pipe install	Dumpers/Tenders	1	1.00	16	0.38
FBPS to Zayante: Road removal/pipe install	Skid Steer Loaders	1	1.00	65	0.37
FBPS to Zayante: Road removal/pipe install	Excavators	1	3.00	158	0.38
FBPS to Zayante: Road removal/pipe install	Cement and Mortar Mixers	1	2.00	9	0.56
FBPS to Zayante: Road removal/pipe install	Tractors/Loaders/Backhoes	1	2.00	170	0.37
FBPS to Zayante: Road removal/pipe install	Rollers	1	0.50	80	0.38
FBPS to Zayante: Road removal/pipe install	Plate Compactors	1	0.50	8	0.43
FBPS to Zayante: Road removal/pipe install	Dumpers/Tenders	1	0.50	16	0.38
FBPS to Zayante: Paving	Pavers	1	5.00	75	0.42
FBPS to Zayante: Paving	Paving Equipment	0	8.00	132	0.36
FBPS to Zayante: Paving	Rollers	1	5.00	170	0.38
FBPS to Zayante: Paving	Tractors/Loaders/Backhoes	1	5.00	97	0.37
FBPS to Zayante: Paving	Tractors/Loaders/Backhoes	1	5.00	170	0.37
FBPS to Zayante: Paving	Skid Steer Loaders	1	5.00	80	0.37
FBPS to Zayante: Paving	Plate Compactors	1	5.00	8	0.43
FBPS to Zayante: Paving	Dumpers/Tenders	1	5.00	16	0.38
Zayante to Big Trees RR: Road removal/pipe install	Air Compressors	0	1.00	78	0.48
Zayante to Big Trees RR: Road removal/pipe install	Excavators	1	1.00	158	0.38
Zayante to Big Trees RR: Road removal/pipe install	Tractors/Loaders/Backhoes	1	1.00	97	0.37
Zayante to Big Trees RR: Road removal/pipe install	Graders	0	8.00	187	0.41

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Zayante to Big Trees RR: Road removal/pipe install	Concrete/Industrial Saws	1	1.00	81	0.73
Zayante to Big Trees RR: Road removal/pipe install	Dumpers/Tenders	1	1.00	16	0.38
Zayante to Big Trees RR: Road removal/pipe install	Skid Steer Loaders	1	1.00	65	0.37
Zayante to Big Trees RR: Road removal/pipe install	Excavators	1	3.00	158	0.38
Zayante to Big Trees RR: Road removal/pipe install	Cement and Mortar Mixers	1	2.00	9	0.56
Zayante to Big Trees RR: Road removal/pipe install	Tractors/Loaders/Backhoes	1	2.00	170	0.37
Zayante to Big Trees RR: Road removal/pipe install	Rollers	1	0.50	80	0.38
Zayante to Big Trees RR: Road removal/pipe install	Plate Compactors	1	0.50	8	0.43
Zayante to Big Trees RR: Road removal/pipe install	Dumpers/Tenders	1	0.50	16	0.38
Zayante to Big Trees RR: Paving	Pavers	1	5.00	75	0.42
Zayante to Big Trees RR: Paving	Paving Equipment	0	8.00	132	0.36
Zayante to Big Trees RR: Paving	Rollers	1	5.00	170	0.38
Zayante to Big Trees RR: Paving	Tractors/Loaders/Backhoes	1	5.00	97	0.37
Zayante to Big Trees RR: Paving	Tractors/Loaders/Backhoes	1	5.00	170	0.37
Zayante to Big Trees RR: Paving	Skid Steer Loaders	1	5.00	80	0.37
Zayante to Big Trees RR: Paving	Plate Compactors	1	5.00	8	0.43
Zayante to Big Trees RR: Paving	Dumpers/Tenders	1	5.00	16	0.38
GH Rd North: Road removal/pipe install	Air Compressors	0	1.00	78	0.48
GH Rd North: Road removal/pipe install	Excavators	1	1.00	158	0.38
GH Rd North: Road removal/pipe install	Tractors/Loaders/Backhoes	1	1.00	97	0.37
GH Rd North: Road removal/pipe install	Graders	0	8.00	187	0.41
GH Rd North: Road removal/pipe install	Concrete/Industrial Saws	1	1.00	81	0.73
GH Rd North: Road removal/pipe install	Dumpers/Tenders	1	1.00	16	0.38
GH Rd North: Road removal/pipe install	Skid Steer Loaders	1	1.00	65	0.37
GH Rd North: Road removal/pipe install	Excavators	1	3.00	158	0.38
GH Rd North: Road removal/pipe install	Cement and Mortar Mixers	1	2.00	9	0.56
GH Rd North: Road removal/pipe install	Tractors/Loaders/Backhoes	1	2.00	170	0.37

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

GH Rd North: Road removal/pipe install	Rollers	1	0.50	80	0.38
GH Rd North: Road removal/pipe install	Plate Compactors	1	0.50	8	0.43
GH Rd North: Road removal/pipe install	Dumpers/Tenders	1	0.50	16	0.38
GH Rd North: Paving	Pavers	1	5.00	75	0.42
GH Rd North: Paving	Paving Equipment	0	8.00	132	0.36
GH Rd North: Paving	Rollers	1	5.00	170	0.38
GH Rd North: Paving	Tractors/Loaders/Backhoes	1	5.00	97	0.37
GH Rd North: Paving	Tractors/Loaders/Backhoes	1	5.00	170	0.37
GH Rd North: Paving	Skid Steer Loaders	1	5.00	80	0.37
GH Rd North: Paving	Plate Compactors	1	5.00	8	0.43
GH Rd North: Paving	Dumpers/Tenders	1	5.00	16	0.38
GH Rd North: Pressure test	Pumps	1	8.00	84	0.74
GH Rd North: Tie in to FBPS	Air Compressors	0	1.00	78	0.48
GH Rd South: Road removal/pipe install	Air Compressors	0	1.00	78	0.48
GH Rd South: Road removal/pipe install	Excavators	1	1.00	158	0.38
GH Rd South: Road removal/pipe install	Tractors/Loaders/Backhoes	1	1.00	97	0.37
GH Rd South: Road removal/pipe install	Graders	0	8.00	187	0.41
GH Rd South: Road removal/pipe install	Concrete/Industrial Saws	1	1.00	81	0.73
GH Rd South: Road removal/pipe install	Dumpers/Tenders	1	1.00	16	0.38
GH Rd South: Road removal/pipe install	Skid Steer Loaders	1	1.00	65	0.37
GH Rd South: Road removal/pipe install	Excavators	1	3.00	158	0.38
GH Rd South: Road removal/pipe install	Cement and Mortar Mixers	1	2.00	9	0.56
GH Rd South: Road removal/pipe install	Tractors/Loaders/Backhoes	1	2.00	170	0.37
GH Rd South: Road removal/pipe install	Rollers	1	0.50	80	0.38
GH Rd South: Road removal/pipe install	Plate Compactors	1	0.50	8	0.43
GH Rd South: Road removal/pipe install	Dumpers/Tenders	1	0.50	16	0.38
GH Rd South: Paving	Pavers	1	5.00	75	0.42
GH Rd South: Paving	Paving Equipment	0	8.00	132	0.36
GH Rd South: Paving	Rollers	1	5.00	170	0.38

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

GH Rd South: Paving	Tractors/Loaders/Backhoes	1	5.00	97	0.37
GH Rd South: Paving	Tractors/Loaders/Backhoes	1	5.00	170	0.37
GH Rd South: Paving	Skid Steer Loaders	1	5.00	80	0.37
GH Rd South: Paving	Plate Compactors	1	5.00	8	0.43
GH Rd South: Paving	Dumpers/Tenders	1	5.00	16	0.38
GH Rd South: Pavement striping	Surfacing Equipment	1	8.00	263	0.30
GH Rd South: Test pipeline	Pumps	1	8.00	84	0.74
GH Rd South: GHWTP tie in	Tractors/Loaders/Backhoes	1	8.00	97	0.37
GH Rd South: Cathodic protection	Surfacing Equipment	1	8.00	263	0.30
Abandon Existing NCP: Outside Henry Cowell	Cement and Mortar Mixers	1	5.00	9	0.56
Abandon Existing NCP: Outside Henry Cowell	Dumpers/Tenders	1	8.00	16	0.38
Abandon Existing NCP: Outside Henry Cowell	Tractors/Loaders/Backhoes	1	1.00	97	0.37
Abandon Existing NCP: Inside Henry Cowell	Cement and Mortar Mixers	1	5.00	9	0.56
Abandon Existing NCP: Inside Henry Cowell	Dumpers/Tenders	1	8.00	16	0.38
Abandon Existing NCP: Inside Henry Cowell	Tractors/Loaders/Backhoes	1	1.00	97	0.37
Brackney North: HDD (South entry)	Graders	0	1.00	187	0.41
Brackney North: HDD (North entry)	Graders	0	1.00	187	0.41
GH Rd South: Pavement striping	Air Compressors	0	6.00	78	0.48
FBPS to Zayante: Road removal/pipe install	Rubber Tired Dozers	0	8.00	247	0.40
Zayante to Big Trees RR: Road removal/pipe install	Rubber Tired Dozers	0	8.00	247	0.40
GH Rd North: Road removal/pipe install	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: HDD (South entry)	Rubber Tired Dozers	0	8.00	247	0.40
GH Rd South: Road removal/pipe install	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: HDD (North entry)	Rubber Tired Dozers	0	8.00	247	0.40
FBPS to Zayante: Road removal/pipe install	Scrapers	0	8.00	367	0.48
Zayante to Big Trees RR: Road removal/pipe install	Scrapers	0	8.00	367	0.48
GH Rd North: Road removal/pipe install	Scrapers	0	8.00	367	0.48

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Brackney North: HDD (South entry)	Scrapers	0	8.00	367	0.48
GH Rd South: Road removal/pipe install	Scrapers	0	8.00	367	0.48
Brackney North: HDD (North entry)	Scrapers	0	8.00	367	0.48
Big Trees RR Crossing: Shaft excavation	Graders	0	8.00	187	0.41
Big Trees RR Crossing: Shaft excavation	Rubber Tired Dozers	0	8.00	247	0.40
Big Trees RR Crossing: Shaft excavation	Scrapers	0	8.00	367	0.48
Big Trees RR Crossing: Shaft excavation	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Brackney North: Mobilization (South H	3	16.00	8.00	50.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Mobilization (North HD	3	16.00	8.00	50.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: HDD (South entry)	12	16.00	16.00	133.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: HDD (North entry)	12	16.00	16.00	133.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Carrier pipeline stagin	3	10.00	8.00	17.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: HDD (pullback)	18	16.00	8.00	23.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Tie-in pipeline construction	5	16.00	16.00	260.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Abandon existing pipel	7	16.00	12.00	64.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Restoration	7	16.00	12.00	80.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Demobilization	4	20.00	12.00	40.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
NCP FBPS to Graham Hill WTP: Staging are	2	6.00	6.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Big Trees RR Crossing: Shaft excav	2	4.00	8.00	33.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Big Trees RR Crossing: Boring and	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Big Trees RR Crossing: Pipe install	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Big Trees RR Crossing: Grout	1	2.00	2.00	10.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Big Trees RR Crossing: Backfill	0	2.00	4.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: CIDH Piles	2	8.00	4.00	18.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Zayante Creek Crossing: Pier scour p	2	6.00	6.00	63.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: Pipe suppor	2	8.00	2.00	30.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: Install pipe s	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: Install flex c	1	2.00	4.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: Grade for dr	1	6.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
FBPS to Zayante: Road removal/pipe ins	11	32.00	58.00	812.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
FBPS to Zayante: Paving	7	22.00	50.00	45.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante to Big Trees RR: Road removal/pip	11	36.00	85.00	2,437.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante to Big Trees RR: Paving	7	22.00	72.00	67.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd North: Road removal/pipe install	11	34.00	78.00	7,148.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd North: Paving	7	22.00	50.00	449.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd North: Pressure test	1	4.00	4.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd North: Tie in to FBPS	0	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: Road removal/pipe install	11	34.00	112.00	6,498.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: Paving	7	22.00	93.00	449.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: Pavement striping	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: Test pipeline	1	4.00	4.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: GHWTP tie in	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: Cathodic protection	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Abandon Existing NCP: Outside Henry C	3	6.00	14.00	173.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Abandon Existing NCP: Inside Henry Co	3	6.00	14.00	404.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Brackney North: Mobilization (South HDD pit) - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4406	3.9172	5.7439	9.0300e-003		0.1934	0.1934		0.1793	0.1793		862.1945	862.1945	0.2657		868.8366
Total	**0.4406**	**3.9172**	**5.7439**	**9.0300e-003**	**0.0000**	**0.1934**	**0.1934**	**0.0000**	**0.1793**	**0.1793**		**862.1945**	**862.1945**	**0.2657**		**868.8366**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.7400e-003	0.4853	0.0709	1.4200e-003	0.3256	3.8100e-003	0.3294	0.0809	3.6500e-003	0.0845		154.8045	154.8045	4.3600e-003	0.0245	162.2198
Vendor	0.0182	0.5412	0.1274	1.6500e-003	0.4328	5.1700e-003	0.4379	0.1083	4.9400e-003	0.1132		176.5316	176.5316	3.5600e-003	0.0266	184.5444
Worker	0.0767	0.0599	0.7683	1.8700e-003	2.1590	1.3500e-003	2.1603	0.5340	1.2500e-003	0.5352		189.3881	189.3881	5.6800e-003	5.3400e-003	191.1228
Total	**0.1046**	**1.0864**	**0.9666**	**4.9400e-003**	**2.9173**	**0.0103**	**2.9276**	**0.7231**	**9.8400e-003**	**0.7330**		**520.7243**	**520.7243**	**0.0136**	**0.0565**	**537.8870**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Brackney North: Mobilization (South HDD pit) - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4406	3.9172	5.7439	9.0300e-003		0.1934	0.1934		0.1793	0.1793	0.0000	862.1945	862.1945	0.2657		868.8366
Total	**0.4406**	**3.9172**	**5.7439**	**9.0300e-003**	**0.0000**	**0.1934**	**0.1934**	**0.0000**	**0.1793**	**0.1793**	**0.0000**	**862.1945**	**862.1945**	**0.2657**		**868.8366**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.7400e-003	0.4853	0.0709	1.4200e-003	0.3256	3.8100e-003	0.3294	0.0809	3.6500e-003	0.0845		154.8045	154.8045	4.3600e-003	0.0245	162.2198
Vendor	0.0182	0.5412	0.1274	1.6500e-003	0.4328	5.1700e-003	0.4379	0.1083	4.9400e-003	0.1132		176.5316	176.5316	3.5600e-003	0.0266	184.5444
Worker	0.0767	0.0599	0.7683	1.8700e-003	2.1590	1.3500e-003	2.1603	0.5340	1.2500e-003	0.5352		189.3881	189.3881	5.6800e-003	5.3400e-003	191.1228
Total	**0.1046**	**1.0864**	**0.9666**	**4.9400e-003**	**2.9173**	**0.0103**	**2.9276**	**0.7231**	**9.8400e-003**	**0.7330**		**520.7243**	**520.7243**	**0.0136**	**0.0565**	**537.8870**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Brackney North: Mobilization (North HDD pit) - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4406	3.9172	5.7439	9.0300e-003		0.1934	0.1934		0.1793	0.1793		862.1945	862.1945	0.2657		868.8366
Total	**0.4406**	**3.9172**	**5.7439**	**9.0300e-003**	**0.0000**	**0.1934**	**0.1934**	**0.0000**	**0.1793**	**0.1793**		**862.1945**	**862.1945**	**0.2657**		**868.8366**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.7400e-003	0.4853	0.0709	1.4200e-003	0.3520	3.8100e-003	0.3558	0.0874	3.6500e-003	0.0910		154.8045	154.8045	4.3600e-003	0.0245	162.2198
Vendor	0.0182	0.5412	0.1274	1.6500e-003	0.4677	5.1700e-003	0.4728	0.1169	4.9400e-003	0.1218		176.5316	176.5316	3.5600e-003	0.0266	184.5444
Worker	0.0767	0.0599	0.7683	1.8700e-003	2.3367	1.3500e-003	2.3380	0.5776	1.2500e-003	0.5788		189.3881	189.3881	5.6800e-003	5.3400e-003	191.1228
Total	**0.1046**	**1.0864**	**0.9666**	**4.9400e-003**	**3.1564**	**0.0103**	**3.1667**	**0.7818**	**9.8400e-003**	**0.7916**		**520.7243**	**520.7243**	**0.0136**	**0.0565**	**537.8870**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Brackney North: Mobilization (North HDD pit) - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4406	3.9172	5.7439	9.0300e-003		0.1934	0.1934		0.1793	0.1793	0.0000	862.1945	862.1945	0.2657		868.8366
Total	**0.4406**	**3.9172**	**5.7439**	**9.0300e-003**	**0.0000**	**0.1934**	**0.1934**	**0.0000**	**0.1793**	**0.1793**	**0.0000**	**862.1945**	**862.1945**	**0.2657**		**868.8366**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.7400e-003	0.4853	0.0709	1.4200e-003	0.3520	3.8100e-003	0.3558	0.0874	3.6500e-003	0.0910		154.8045	154.8045	4.3600e-003	0.0245	162.2198
Vendor	0.0182	0.5412	0.1274	1.6500e-003	0.4677	5.1700e-003	0.4728	0.1169	4.9400e-003	0.1218		176.5316	176.5316	3.5600e-003	0.0266	184.5444
Worker	0.0767	0.0599	0.7683	1.8700e-003	2.3367	1.3500e-003	2.3380	0.5776	1.2500e-003	0.5788		189.3881	189.3881	5.6800e-003	5.3400e-003	191.1228
Total	**0.1046**	**1.0864**	**0.9666**	**4.9400e-003**	**3.1564**	**0.0103**	**3.1667**	**0.7818**	**9.8400e-003**	**0.7916**		**520.7243**	**520.7243**	**0.0136**	**0.0565**	**537.8870**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Brackney North: HDD (South entry) - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.2500e-003	0.0000	1.2500e-003	1.9000e-004	0.0000	1.9000e-004			0.0000			0.0000
Off-Road	3.9959	35.4978	45.7642	0.0838		1.8166	1.8166		1.7620	1.7620		8,010.9352	8,010.9352	1.3099		8,043.6817
Total	**3.9959**	**35.4978**	**45.7642**	**0.0838**	**1.2500e-003**	**1.8166**	**1.8178**	**1.9000e-004**	**1.7620**	**1.7622**		**8,010.9352**	**8,010.9352**	**1.3099**		**8,043.6817**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0110	0.5470	0.0799	1.6000e-003	0.3968	4.2900e-003	0.4011	0.0985	4.1100e-003	0.1026		174.4831	174.4831	4.9100e-003	0.0276	182.8410
Vendor	0.0364	1.0824	0.2548	3.2900e-003	0.9353	0.0103	0.9457	0.2337	9.8900e-003	0.2436		353.0633	353.0633	7.1200e-003	0.0532	369.0888
Worker	0.0767	0.0599	0.7683	1.8700e-003	2.3367	1.3500e-003	2.3380	0.5776	1.2500e-003	0.5788		189.3881	189.3881	5.6800e-003	5.3400e-003	191.1228
Total	**0.1241**	**1.6893**	**1.1030**	**6.7600e-003**	**3.6688**	**0.0160**	**3.6847**	**0.9098**	**0.0153**	**0.9250**		**716.9344**	**716.9344**	**0.0177**	**0.0862**	**743.0526**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Brackney North: HDD (South entry) - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.6000e-004	0.0000	5.6000e-004	9.0000e-005	0.0000	9.0000e-005			0.0000			0.0000
Off-Road	3.9959	35.4978	45.7642	0.0838		1.8166	1.8166		1.7620	1.7620	0.0000	8,010.9352	8,010.9352	1.3099		8,043.6817
Total	**3.9959**	**35.4978**	**45.7642**	**0.0838**	**5.6000e-004**	**1.8166**	**1.8171**	**9.0000e-005**	**1.7620**	**1.7621**	**0.0000**	**8,010.9352**	**8,010.9352**	**1.3099**		**8,043.6817**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0110	0.5470	0.0799	1.6000e-003	0.3968	4.2900e-003	0.4011	0.0985	4.1100e-003	0.1026		174.4831	174.4831	4.9100e-003	0.0276	182.8410
Vendor	0.0364	1.0824	0.2548	3.2900e-003	0.9353	0.0103	0.9457	0.2337	9.8900e-003	0.2436		353.0633	353.0633	7.1200e-003	0.0532	369.0888
Worker	0.0767	0.0599	0.7683	1.8700e-003	2.3367	1.3500e-003	2.3380	0.5776	1.2500e-003	0.5788		189.3881	189.3881	5.6800e-003	5.3400e-003	191.1228
Total	**0.1241**	**1.6893**	**1.1030**	**6.7600e-003**	**3.6688**	**0.0160**	**3.6847**	**0.9098**	**0.0153**	**0.9250**		**716.9344**	**716.9344**	**0.0177**	**0.0862**	**743.0526**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Brackney North: HDD (North entry) - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.2500e-003	0.0000	1.2500e-003	1.9000e-004	0.0000	1.9000e-004			0.0000			0.0000
Off-Road	3.9959	35.4978	45.7642	0.0838		1.8166	1.8166		1.7620	1.7620		8,010.9352	8,010.9352	1.3099		8,043.6817
Total	**3.9959**	**35.4978**	**45.7642**	**0.0838**	**1.2500e-003**	**1.8166**	**1.8178**	**1.9000e-004**	**1.7620**	**1.7622**		**8,010.9352**	**8,010.9352**	**1.3099**		**8,043.6817**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0110	0.5470	0.0799	1.6000e-003	0.0391	4.2900e-003	0.0434	0.0107	4.1100e-003	0.0148		174.4831	174.4831	4.9100e-003	0.0276	182.8410
Vendor	0.0364	1.0824	0.2548	3.2900e-003	0.0977	0.0103	0.1080	0.0281	9.8900e-003	0.0380		353.0633	353.0633	7.1200e-003	0.0532	369.0888
Worker	0.0767	0.0599	0.7683	1.8700e-003	0.2044	1.3500e-003	0.2057	0.0542	1.2500e-003	0.0554		189.3881	189.3881	5.6800e-003	5.3400e-003	191.1228
Total	**0.1241**	**1.6893**	**1.1030**	**6.7600e-003**	**0.3411**	**0.0160**	**0.3571**	**0.0930**	**0.0153**	**0.1082**		**716.9344**	**716.9344**	**0.0177**	**0.0862**	**743.0526**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Brackney North: HDD (North entry) - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.6000e-004	0.0000	5.6000e-004	9.0000e-005	0.0000	9.0000e-005			0.0000			0.0000
Off-Road	3.9959	35.4978	45.7642	0.0838		1.8166	1.8166		1.7620	1.7620	0.0000	8,010.9352	8,010.9352	1.3099		8,043.6817
Total	**3.9959**	**35.4978**	**45.7642**	**0.0838**	**5.6000e-004**	**1.8166**	**1.8171**	**9.0000e-005**	**1.7620**	**1.7621**	**0.0000**	**8,010.9352**	**8,010.9352**	**1.3099**		**8,043.6817**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0110	0.5470	0.0799	1.6000e-003	0.0391	4.2900e-003	0.0434	0.0107	4.1100e-003	0.0148		174.4831	174.4831	4.9100e-003	0.0276	182.8410
Vendor	0.0364	1.0824	0.2548	3.2900e-003	0.0977	0.0103	0.1080	0.0281	9.8900e-003	0.0380		353.0633	353.0633	7.1200e-003	0.0532	369.0888
Worker	0.0767	0.0599	0.7683	1.8700e-003	0.2044	1.3500e-003	0.2057	0.0542	1.2500e-003	0.0554		189.3881	189.3881	5.6800e-003	5.3400e-003	191.1228
Total	**0.1241**	**1.6893**	**1.1030**	**6.7600e-003**	**0.3411**	**0.0160**	**0.3571**	**0.0930**	**0.0153**	**0.1082**		**716.9344**	**716.9344**	**0.0177**	**0.0862**	**743.0526**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Brackney North: Carrier pipeline staging area prep - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6816	5.0169	8.2061	0.0129		0.2357	0.2357		0.2220	0.2220		1,207.5083	1,207.5083	0.3483		1,216.2147
Total	**0.6816**	**5.0169**	**8.2061**	**0.0129**	**0.0000**	**0.2357**	**0.2357**	**0.0000**	**0.2220**	**0.2220**		**1,207.5083**	**1,207.5083**	**0.3483**		**1,216.2147**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.4300e-003	0.1213	0.0177	3.6000e-004	8.6800e-003	9.5000e-004	9.6300e-003	2.3700e-003	9.1000e-004	3.2800e-003		38.7011	38.7011	1.0900e-003	6.1300e-003	40.5550
Vendor	0.0182	0.5412	0.1274	1.6500e-003	0.0488	5.1700e-003	0.0540	0.0140	4.9400e-003	0.0190		176.5316	176.5316	3.5600e-003	0.0266	184.5444
Worker	0.0479	0.0374	0.4802	1.1700e-003	0.1277	8.5000e-004	0.1286	0.0339	7.8000e-004	0.0347		118.3676	118.3676	3.5500e-003	3.3400e-003	119.4518
Total	**0.0686**	**0.7000**	**0.6253**	**3.1800e-003**	**0.1852**	**6.9700e-003**	**0.1922**	**0.0503**	**6.6300e-003**	**0.0569**		**333.6003**	**333.6003**	**8.2000e-003**	**0.0361**	**344.5511**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Brackney North: Carrier pipeline staging area prep - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6816	5.0169	8.2061	0.0129		0.2357	0.2357		0.2220	0.2220	0.0000	1,207.5083	1,207.5083	0.3483		1,216.2147
Total	**0.6816**	**5.0169**	**8.2061**	**0.0129**	**0.0000**	**0.2357**	**0.2357**	**0.0000**	**0.2220**	**0.2220**	**0.0000**	**1,207.5083**	**1,207.5083**	**0.3483**		**1,216.2147**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.4300e-003	0.1213	0.0177	3.6000e-004	8.6800e-003	9.5000e-004	9.6300e-003	2.3700e-003	9.1000e-004	3.2800e-003		38.7011	38.7011	1.0900e-003	6.1300e-003	40.5550
Vendor	0.0182	0.5412	0.1274	1.6500e-003	0.0488	5.1700e-003	0.0540	0.0140	4.9400e-003	0.0190		176.5316	176.5316	3.5600e-003	0.0266	184.5444
Worker	0.0479	0.0374	0.4802	1.1700e-003	0.1277	8.5000e-004	0.1286	0.0339	7.8000e-004	0.0347		118.3676	118.3676	3.5500e-003	3.3400e-003	119.4518
Total	**0.0686**	**0.7000**	**0.6253**	**3.1800e-003**	**0.1852**	**6.9700e-003**	**0.1922**	**0.0503**	**6.6300e-003**	**0.0569**		**333.6003**	**333.6003**	**8.2000e-003**	**0.0361**	**344.5511**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Brackney North: HDD (pullback) - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	10.5998	93.0901	132.2389	0.2381		4.6379	4.6379		4.4671	4.4671		22,820.0576	22,820.0576	4.5638		22,934.1533
Total	**10.5998**	**93.0901**	**132.2389**	**0.2381**		**4.6379**	**4.6379**		**4.4671**	**4.4671**		**22,820.0576**	**22,820.0576**	**4.5638**		**22,934.1533**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0560	2.7904	0.4075	8.1800e-003	0.1996	0.0219	0.2215	0.0546	0.0210	0.0755		890.1260	890.1260	0.0251	0.1410	932.7639
Vendor	0.0182	0.5412	0.1274	1.6500e-003	0.0488	5.1700e-003	0.0540	0.0140	4.9400e-003	0.0190		176.5316	176.5316	3.5600e-003	0.0266	184.5444
Worker	0.0767	0.0599	0.7683	1.8700e-003	0.2044	1.3500e-003	0.2057	0.0542	1.2500e-003	0.0554		189.3881	189.3881	5.6800e-003	5.3400e-003	191.1228
Total	**0.1509**	**3.3915**	**1.3032**	**0.0117**	**0.4528**	**0.0284**	**0.4812**	**0.1228**	**0.0272**	**0.1500**		**1,256.0457**	**1,256.0457**	**0.0343**	**0.1729**	**1,308.4311**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Brackney North: HDD (pullback) - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	10.5998	93.0901	132.2389	0.2381		4.6379	4.6379		4.4671	4.4671	0.0000	22,820.0576	22,820.0576	4.5638		22,934.1533
Total	**10.5998**	**93.0901**	**132.2389**	**0.2381**		**4.6379**	**4.6379**		**4.4671**	**4.4671**	**0.0000**	**22,820.0576**	**22,820.0576**	**4.5638**		**22,934.1533**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0560	2.7904	0.4075	8.1800e-003	0.1996	0.0219	0.2215	0.0546	0.0210	0.0755		890.1260	890.1260	0.0251	0.1410	932.7639
Vendor	0.0182	0.5412	0.1274	1.6500e-003	0.0488	5.1700e-003	0.0540	0.0140	4.9400e-003	0.0190		176.5316	176.5316	3.5600e-003	0.0266	184.5444
Worker	0.0767	0.0599	0.7683	1.8700e-003	0.2044	1.3500e-003	0.2057	0.0542	1.2500e-003	0.0554		189.3881	189.3881	5.6800e-003	5.3400e-003	191.1228
Total	**0.1509**	**3.3915**	**1.3032**	**0.0117**	**0.4528**	**0.0284**	**0.4812**	**0.1228**	**0.0272**	**0.1500**		**1,256.0457**	**1,256.0457**	**0.0343**	**0.1729**	**1,308.4311**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Brackney North: Tie-in pipeline construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0306	8.8023	12.2412	0.0191		0.4338	0.4338		0.4042	0.4042		1,811.3232	1,811.3232	0.5435		1,824.9117
Total	**1.0306**	**8.8023**	**12.2412**	**0.0191**		**0.4338**	**0.4338**		**0.4042**	**0.4042**		**1,811.3232**	**1,811.3232**	**0.5435**		**1,824.9117**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0487	2.4264	0.3544	7.1200e-003	0.1735	0.0191	0.1926	0.0474	0.0182	0.0657		774.0226	774.0226	0.0218	0.1226	811.0990
Vendor	0.0364	1.0824	0.2548	3.2900e-003	0.0977	0.0103	0.1080	0.0281	9.8900e-003	0.0380		353.0633	353.0633	7.1200e-003	0.0532	369.0888
Worker	0.0767	0.0599	0.7683	1.8700e-003	0.2044	1.3500e-003	0.2057	0.0542	1.2500e-003	0.0554		189.3881	189.3881	5.6800e-003	5.3400e-003	191.1228
Total	**0.1618**	**3.5687**	**1.3775**	**0.0123**	**0.4756**	**0.0307**	**0.5063**	**0.1297**	**0.0294**	**0.1591**		**1,316.4740**	**1,316.4740**	**0.0346**	**0.1811**	**1,371.3106**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Brackney North: Tie-in pipeline construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0306	8.8023	12.2412	0.0191		0.4338	0.4338		0.4042	0.4042	0.0000	1,811.3232	1,811.3232	0.5435		1,824.9117
Total	**1.0306**	**8.8023**	**12.2412**	**0.0191**		**0.4338**	**0.4338**		**0.4042**	**0.4042**	**0.0000**	**1,811.3232**	**1,811.3232**	**0.5435**		**1,824.9117**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0487	2.4264	0.3544	7.1200e-003	0.1735	0.0191	0.1926	0.0474	0.0182	0.0657		774.0226	774.0226	0.0218	0.1226	811.0990
Vendor	0.0364	1.0824	0.2548	3.2900e-003	0.0977	0.0103	0.1080	0.0281	9.8900e-003	0.0380		353.0633	353.0633	7.1200e-003	0.0532	369.0888
Worker	0.0767	0.0599	0.7683	1.8700e-003	0.2044	1.3500e-003	0.2057	0.0542	1.2500e-003	0.0554		189.3881	189.3881	5.6800e-003	5.3400e-003	191.1228
Total	**0.1618**	**3.5687**	**1.3775**	**0.0123**	**0.4756**	**0.0307**	**0.5063**	**0.1297**	**0.0294**	**0.1591**		**1,316.4740**	**1,316.4740**	**0.0346**	**0.1811**	**1,371.3106**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Brackney North: Tie-in pipeline construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9595	8.0650	12.2278	0.0191		0.3860	0.3860		0.3596	0.3596		1,811.3754	1,811.3754	0.5414		1,824.9096
Total	**0.9595**	**8.0650**	**12.2278**	**0.0191**		**0.3860**	**0.3860**		**0.3596**	**0.3596**		**1,811.3754**	**1,811.3754**	**0.5414**		**1,824.9096**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0312	2.1100	0.3220	6.8700e-003	0.1736	0.0143	0.1878	0.0475	0.0137	0.0611		748.4170	748.4170	0.0212	0.1186	784.2777
Vendor	0.0219	0.9215	0.2177	3.1800e-003	0.0977	5.2000e-003	0.1029	0.0281	4.9800e-003	0.0331		341.4218	341.4218	6.4800e-003	0.0514	356.8882
Worker	0.0715	0.0527	0.7007	1.8200e-003	0.2044	1.2700e-003	0.2056	0.0542	1.1700e-003	0.0554		183.7166	183.7166	5.0800e-003	4.9000e-003	185.3035
Total	**0.1246**	**3.0842**	**1.2404**	**0.0119**	**0.4756**	**0.0207**	**0.4963**	**0.1297**	**0.0198**	**0.1496**		**1,273.5553**	**1,273.5553**	**0.0328**	**0.1748**	**1,326.4693**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Brackney North: Tie-in pipeline construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9595	8.0650	12.2278	0.0191		0.3860	0.3860		0.3596	0.3596	0.0000	1,811.3754	1,811.3754	0.5414		1,824.9096
Total	**0.9595**	**8.0650**	**12.2278**	**0.0191**		**0.3860**	**0.3860**		**0.3596**	**0.3596**	**0.0000**	**1,811.3754**	**1,811.3754**	**0.5414**		**1,824.9096**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0312	2.1100	0.3220	6.8700e-003	0.1736	0.0143	0.1878	0.0475	0.0137	0.0611		748.4170	748.4170	0.0212	0.1186	784.2777
Vendor	0.0219	0.9215	0.2177	3.1800e-003	0.0977	5.2000e-003	0.1029	0.0281	4.9800e-003	0.0331		341.4218	341.4218	6.4800e-003	0.0514	356.8882
Worker	0.0715	0.0527	0.7007	1.8200e-003	0.2044	1.2700e-003	0.2056	0.0542	1.1700e-003	0.0554		183.7166	183.7166	5.0800e-003	4.9000e-003	185.3035
Total	**0.1246**	**3.0842**	**1.2404**	**0.0119**	**0.4756**	**0.0207**	**0.4963**	**0.1297**	**0.0198**	**0.1496**		**1,273.5553**	**1,273.5553**	**0.0328**	**0.1748**	**1,326.4693**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.9 NCP FBPS to Graham Hill WTP: Staging area - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1881	1.7680	2.3567	3.4900e-003		0.0845	0.0845		0.0784	0.0784		332.0467	332.0467	0.1008		334.5668
Total	**0.1881**	**1.7680**	**2.3567**	**3.4900e-003**	**0.0000**	**0.0845**	**0.0845**	**0.0000**	**0.0784**	**0.0784**		**332.0467**	**332.0467**	**0.1008**		**334.5668**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.2200e-003	0.3456	0.0816	1.1900e-003	0.0366	1.9500e-003	0.0386	0.0105	1.8700e-003	0.0124		128.0332	128.0332	2.4300e-003	0.0193	133.8331
Worker	0.0268	0.0198	0.2628	6.8000e-004	0.0766	4.8000e-004	0.0771	0.0203	4.4000e-004	0.0208		68.8937	68.8937	1.9000e-003	1.8400e-003	69.4888
Total	**0.0350**	**0.3653**	**0.3444**	**1.8700e-003**	**0.1133**	**2.4300e-003**	**0.1157**	**0.0309**	**2.3100e-003**	**0.0332**		**196.9269**	**196.9269**	**4.3300e-003**	**0.0211**	**203.3219**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.9 NCP FBPS to Graham Hill WTP: Staging area - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1881	1.7680	2.3567	3.4900e-003		0.0845	0.0845		0.0784	0.0784	0.0000	332.0467	332.0467	0.1008		334.5668
Total	**0.1881**	**1.7680**	**2.3567**	**3.4900e-003**	**0.0000**	**0.0845**	**0.0845**	**0.0000**	**0.0784**	**0.0784**	**0.0000**	**332.0467**	**332.0467**	**0.1008**		**334.5668**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.2200e-003	0.3456	0.0816	1.1900e-003	0.0366	1.9500e-003	0.0386	0.0105	1.8700e-003	0.0124		128.0332	128.0332	2.4300e-003	0.0193	133.8331
Worker	0.0268	0.0198	0.2628	6.8000e-004	0.0766	4.8000e-004	0.0771	0.0203	4.4000e-004	0.0208		68.8937	68.8937	1.9000e-003	1.8400e-003	69.4888
Total	**0.0350**	**0.3653**	**0.3444**	**1.8700e-003**	**0.1133**	**2.4300e-003**	**0.1157**	**0.0309**	**2.3100e-003**	**0.0332**		**196.9269**	**196.9269**	**4.3300e-003**	**0.0211**	**203.3219**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.10 Brackney North: Abandon existing pipeline - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4190	12.0419	17.2257	0.0294		0.5782	0.5782		0.5661	0.5661		2,771.8185	2,771.8185	0.3542		2,780.6731
Total	**1.4190**	**12.0419**	**17.2257**	**0.0294**		**0.5782**	**0.5782**		**0.5661**	**0.5661**		**2,771.8185**	**2,771.8185**	**0.3542**		**2,780.6731**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0333	2.2507	0.3435	7.3300e-003	0.1851	0.0152	0.2004	0.0506	0.0146	0.0652		798.3114	798.3114	0.0226	0.1265	836.5628
Vendor	0.0164	0.6911	0.1633	2.3800e-003	0.0732	3.9000e-003	0.0771	0.0211	3.7300e-003	0.0248		256.0664	256.0664	4.8600e-003	0.0385	267.6661
Worker	0.0715	0.0527	0.7007	1.8200e-003	0.2044	1.2700e-003	0.2056	0.0542	1.1700e-003	0.0554		183.7166	183.7166	5.0800e-003	4.9000e-003	185.3035
Total	**0.1212**	**2.9945**	**1.2074**	**0.0115**	**0.4627**	**0.0204**	**0.4831**	**0.1259**	**0.0195**	**0.1454**		**1,238.0943**	**1,238.0943**	**0.0326**	**0.1699**	**1,289.5325**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.10 Brackney North: Abandon existing pipeline - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4190	12.0419	17.2257	0.0294		0.5782	0.5782		0.5661	0.5661	0.0000	2,771.8185	2,771.8185	0.3542		2,780.6731
Total	**1.4190**	**12.0419**	**17.2257**	**0.0294**		**0.5782**	**0.5782**		**0.5661**	**0.5661**	**0.0000**	**2,771.8185**	**2,771.8185**	**0.3542**		**2,780.6731**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0333	2.2507	0.3435	7.3300e-003	0.1851	0.0152	0.2004	0.0506	0.0146	0.0652		798.3114	798.3114	0.0226	0.1265	836.5628
Vendor	0.0164	0.6911	0.1633	2.3800e-003	0.0732	3.9000e-003	0.0771	0.0211	3.7300e-003	0.0248		256.0664	256.0664	4.8600e-003	0.0385	267.6661
Worker	0.0715	0.0527	0.7007	1.8200e-003	0.2044	1.2700e-003	0.2056	0.0542	1.1700e-003	0.0554		183.7166	183.7166	5.0800e-003	4.9000e-003	185.3035
Total	**0.1212**	**2.9945**	**1.2074**	**0.0115**	**0.4627**	**0.0204**	**0.4831**	**0.1259**	**0.0195**	**0.1454**		**1,238.0943**	**1,238.0943**	**0.0326**	**0.1699**	**1,289.5325**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.11 Brackney North: Restoration - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2431	11.1262	17.0975	0.0258		0.5748	0.5748		0.5364	0.5364		2,486.8437	2,486.8437	0.7054		2,504.4781
Total	**1.2431**	**11.1262**	**17.0975**	**0.0258**	**0.0000**	**0.5748**	**0.5748**	**0.0000**	**0.5364**	**0.5364**		**2,486.8437**	**2,486.8437**	**0.7054**		**2,504.4781**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0125	0.8440	0.1288	2.7500e-003	0.0694	5.7100e-003	0.0751	0.0190	5.4600e-003	0.0244		299.3668	299.3668	8.4900e-003	0.0474	313.7111
Vendor	0.0164	0.6911	0.1633	2.3800e-003	0.0732	3.9000e-003	0.0771	0.0211	3.7300e-003	0.0248		256.0664	256.0664	4.8600e-003	0.0385	267.6661
Worker	0.0715	0.0527	0.7007	1.8200e-003	0.2044	1.2700e-003	0.2056	0.0542	1.1700e-003	0.0554		183.7166	183.7166	5.0800e-003	4.9000e-003	185.3035
Total	**0.1004**	**1.5878**	**0.9928**	**6.9500e-003**	**0.3470**	**0.0109**	**0.3579**	**0.0943**	**0.0104**	**0.1046**		**739.1497**	**739.1497**	**0.0184**	**0.0908**	**766.6807**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.11 Brackney North: Restoration - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2431	11.1262	17.0975	0.0258		0.5748	0.5748		0.5364	0.5364	0.0000	2,486.8437	2,486.8437	0.7054		2,504.4781
Total	**1.2431**	**11.1262**	**17.0975**	**0.0258**	**0.0000**	**0.5748**	**0.5748**	**0.0000**	**0.5364**	**0.5364**	**0.0000**	**2,486.8437**	**2,486.8437**	**0.7054**		**2,504.4781**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0125	0.8440	0.1288	2.7500e-003	0.0694	5.7100e-003	0.0751	0.0190	5.4600e-003	0.0244		299.3668	299.3668	8.4900e-003	0.0474	313.7111
Vendor	0.0164	0.6911	0.1633	2.3800e-003	0.0732	3.9000e-003	0.0771	0.0211	3.7300e-003	0.0248		256.0664	256.0664	4.8600e-003	0.0385	267.6661
Worker	0.0715	0.0527	0.7007	1.8200e-003	0.2044	1.2700e-003	0.2056	0.0542	1.1700e-003	0.0554		183.7166	183.7166	5.0800e-003	4.9000e-003	185.3035
Total	**0.1004**	**1.5878**	**0.9928**	**6.9500e-003**	**0.3470**	**0.0109**	**0.3579**	**0.0943**	**0.0104**	**0.1046**		**739.1497**	**739.1497**	**0.0184**	**0.0908**	**766.6807**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.12 Brackney North: Demobilization - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6801	6.1686	10.9782	0.0166		0.3032	0.3032		0.2790	0.2790		1,603.3643	1,603.3643	0.5186		1,616.3283
Total	**0.6801**	**6.1686**	**10.9782**	**0.0166**	**0.0000**	**0.3032**	**0.3032**	**0.0000**	**0.2790**	**0.2790**		**1,603.3643**	**1,603.3643**	**0.5186**		**1,616.3283**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0125	0.8440	0.1288	2.7500e-003	0.0694	5.7100e-003	0.0751	0.0190	5.4600e-003	0.0244		299.3668	299.3668	8.4900e-003	0.0474	313.7111
Vendor	0.0164	0.6911	0.1633	2.3800e-003	0.0732	3.9000e-003	0.0771	0.0211	3.7300e-003	0.0248		256.0664	256.0664	4.8600e-003	0.0385	267.6661
Worker	0.0893	0.0659	0.8758	2.2700e-003	0.2555	1.5900e-003	0.2571	0.0678	1.4700e-003	0.0692		229.6457	229.6457	6.3500e-003	6.1200e-003	231.6294
Total	**0.1182**	**1.6010**	**1.1679**	**7.4000e-003**	**0.3981**	**0.0112**	**0.4093**	**0.1078**	**0.0107**	**0.1185**		**785.0788**	**785.0788**	**0.0197**	**0.0921**	**813.0066**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.12 Brackney North: Demobilization - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6801	6.1686	10.9782	0.0166		0.3032	0.3032		0.2790	0.2790	0.0000	1,603.3643	1,603.3643	0.5186		1,616.3283
Total	**0.6801**	**6.1686**	**10.9782**	**0.0166**	**0.0000**	**0.3032**	**0.3032**	**0.0000**	**0.2790**	**0.2790**	**0.0000**	**1,603.3643**	**1,603.3643**	**0.5186**		**1,616.3283**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0125	0.8440	0.1288	2.7500e-003	0.0694	5.7100e-003	0.0751	0.0190	5.4600e-003	0.0244		299.3668	299.3668	8.4900e-003	0.0474	313.7111
Vendor	0.0164	0.6911	0.1633	2.3800e-003	0.0732	3.9000e-003	0.0771	0.0211	3.7300e-003	0.0248		256.0664	256.0664	4.8600e-003	0.0385	267.6661
Worker	0.0893	0.0659	0.8758	2.2700e-003	0.2555	1.5900e-003	0.2571	0.0678	1.4700e-003	0.0692		229.6457	229.6457	6.3500e-003	6.1200e-003	231.6294
Total	**0.1182**	**1.6010**	**1.1679**	**7.4000e-003**	**0.3981**	**0.0112**	**0.4093**	**0.1078**	**0.0107**	**0.1185**		**785.0788**	**785.0788**	**0.0197**	**0.0921**	**813.0066**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.13 Big Trees RR Crossing: Shaft excavation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.0600e-003	0.0000	4.0600e-003	6.1000e-004	0.0000	6.1000e-004			0.0000			0.0000
Off-Road	0.2621	2.0132	3.5086	5.9200e-003		0.0932	0.0932		0.0871	0.0871		561.0460	561.0460	0.1683		565.2531
Total	**0.2621**	**2.0132**	**3.5086**	**5.9200e-003**	**4.0600e-003**	**0.0932**	**0.0972**	**6.1000e-004**	**0.0871**	**0.0877**		**561.0460**	**561.0460**	**0.1683**		**565.2531**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0206	1.3926	0.2125	4.5400e-003	0.1146	9.4200e-003	0.1240	0.0313	9.0100e-003	0.0403		493.9552	493.9552	0.0140	0.0783	517.6233
Vendor	0.0110	0.4607	0.1089	1.5900e-003	0.0488	2.6000e-003	0.0514	0.0140	2.4900e-003	0.0165		170.7109	170.7109	3.2400e-003	0.0257	178.4441
Worker	0.0179	0.0132	0.1752	4.5000e-004	0.0511	3.2000e-004	0.0514	0.0136	2.9000e-004	0.0138		45.9291	45.9291	1.2700e-003	1.2200e-003	46.3259
Total	**0.0494**	**1.8665**	**0.4965**	**6.5800e-003**	**0.2145**	**0.0123**	**0.2268**	**0.0589**	**0.0118**	**0.0707**		**710.5952**	**710.5952**	**0.0185**	**0.1052**	**742.3932**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.13 Big Trees RR Crossing: Shaft excavation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.8300e-003	0.0000	1.8300e-003	2.8000e-004	0.0000	2.8000e-004			0.0000			0.0000
Off-Road	0.2621	2.0132	3.5086	5.9200e-003		0.0932	0.0932		0.0871	0.0871	0.0000	561.0460	561.0460	0.1683		565.2531
Total	**0.2621**	**2.0132**	**3.5086**	**5.9200e-003**	**1.8300e-003**	**0.0932**	**0.0950**	**2.8000e-004**	**0.0871**	**0.0874**	**0.0000**	**561.0460**	**561.0460**	**0.1683**		**565.2531**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0206	1.3926	0.2125	4.5400e-003	0.1146	9.4200e-003	0.1240	0.0313	9.0100e-003	0.0403		493.9552	493.9552	0.0140	0.0783	517.6233
Vendor	0.0110	0.4607	0.1089	1.5900e-003	0.0488	2.6000e-003	0.0514	0.0140	2.4900e-003	0.0165		170.7109	170.7109	3.2400e-003	0.0257	178.4441
Worker	0.0179	0.0132	0.1752	4.5000e-004	0.0511	3.2000e-004	0.0514	0.0136	2.9000e-004	0.0138		45.9291	45.9291	1.2700e-003	1.2200e-003	46.3259
Total	**0.0494**	**1.8665**	**0.4965**	**6.5800e-003**	**0.2145**	**0.0123**	**0.2268**	**0.0589**	**0.0118**	**0.0707**		**710.5952**	**710.5952**	**0.0185**	**0.1052**	**742.3932**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.14 Big Trees RR Crossing: Boring and casing - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2151	2.0396	2.0329	9.4600e-003		0.0660	0.0660		0.0608	0.0608		915.4033	915.4033	0.2961		922.8048
Total	**0.2151**	**2.0396**	**2.0329**	**9.4600e-003**		**0.0660**	**0.0660**		**0.0608**	**0.0608**		**915.4033**	**915.4033**	**0.2961**		**922.8048**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7400e-003	0.1152	0.0272	4.0000e-004	0.0122	6.5000e-004	0.0129	3.5100e-003	6.2000e-004	4.1300e-003		42.6777	42.6777	8.1000e-004	6.4200e-003	44.6110
Worker	8.9300e-003	6.5900e-003	0.0876	2.3000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		22.9646	22.9646	6.3000e-004	6.1000e-004	23.1629
Total	**0.0117**	**0.1218**	**0.1148**	**6.3000e-004**	**0.0378**	**8.1000e-004**	**0.0386**	**0.0103**	**7.7000e-004**	**0.0111**		**65.6423**	**65.6423**	**1.4400e-003**	**7.0300e-003**	**67.7740**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.14 Big Trees RR Crossing: Boring and casing - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2151	2.0396	2.0329	9.4600e-003		0.0660	0.0660		0.0608	0.0608	0.0000	915.4033	915.4033	0.2961		922.8048
Total	**0.2151**	**2.0396**	**2.0329**	**9.4600e-003**		**0.0660**	**0.0660**		**0.0608**	**0.0608**	**0.0000**	**915.4033**	**915.4033**	**0.2961**		**922.8048**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7400e-003	0.1152	0.0272	4.0000e-004	0.0122	6.5000e-004	0.0129	3.5100e-003	6.2000e-004	4.1300e-003		42.6777	42.6777	8.1000e-004	6.4200e-003	44.6110
Worker	8.9300e-003	6.5900e-003	0.0876	2.3000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		22.9646	22.9646	6.3000e-004	6.1000e-004	23.1629
Total	**0.0117**	**0.1218**	**0.1148**	**6.3000e-004**	**0.0378**	**8.1000e-004**	**0.0386**	**0.0103**	**7.7000e-004**	**0.0111**		**65.6423**	**65.6423**	**1.4400e-003**	**7.0300e-003**	**67.7740**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.15 Big Trees RR Crossing: Pipe install - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1514	1.5357	2.2313	3.1200e-003		0.0758	0.0758		0.0698	0.0698		301.5765	301.5765	0.0975		304.0149
Total	**0.1514**	**1.5357**	**2.2313**	**3.1200e-003**		**0.0758**	**0.0758**		**0.0698**	**0.0698**		**301.5765**	**301.5765**	**0.0975**		**304.0149**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7400e-003	0.1152	0.0272	4.0000e-004	0.0122	6.5000e-004	0.0129	3.5100e-003	6.2000e-004	4.1300e-003		42.6777	42.6777	8.1000e-004	6.4200e-003	44.6110
Worker	8.9300e-003	6.5900e-003	0.0876	2.3000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		22.9646	22.9646	6.3000e-004	6.1000e-004	23.1629
Total	**0.0117**	**0.1218**	**0.1148**	**6.3000e-004**	**0.0378**	**8.1000e-004**	**0.0386**	**0.0103**	**7.7000e-004**	**0.0111**		**65.6423**	**65.6423**	**1.4400e-003**	**7.0300e-003**	**67.7740**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.15 Big Trees RR Crossing: Pipe install - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1514	1.5357	2.2313	3.1200e-003		0.0758	0.0758		0.0698	0.0698	0.0000	301.5765	301.5765	0.0975		304.0149
Total	**0.1514**	**1.5357**	**2.2313**	**3.1200e-003**		**0.0758**	**0.0758**		**0.0698**	**0.0698**	**0.0000**	**301.5765**	**301.5765**	**0.0975**		**304.0149**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7400e-003	0.1152	0.0272	4.0000e-004	0.0122	6.5000e-004	0.0129	3.5100e-003	6.2000e-004	4.1300e-003		42.6777	42.6777	8.1000e-004	6.4200e-003	44.6110
Worker	8.9300e-003	6.5900e-003	0.0876	2.3000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		22.9646	22.9646	6.3000e-004	6.1000e-004	23.1629
Total	**0.0117**	**0.1218**	**0.1148**	**6.3000e-004**	**0.0378**	**8.1000e-004**	**0.0386**	**0.0103**	**7.7000e-004**	**0.0111**		**65.6423**	**65.6423**	**1.4400e-003**	**7.0300e-003**	**67.7740**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.16 Big Trees RR Crossing: Grout - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0588	0.3682	0.3084	7.1000e-004		0.0143	0.0143		0.0143	0.0143		50.5163	50.5163	5.2400e-003		50.6474
Total	**0.0588**	**0.3682**	**0.3084**	**7.1000e-004**		**0.0143**	**0.0143**		**0.0143**	**0.0143**		**50.5163**	**50.5163**	**5.2400e-003**		**50.6474**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.2400e-003	0.4220	0.0644	1.3700e-003	0.0347	2.8500e-003	0.0376	9.4900e-003	2.7300e-003	0.0122		149.6834	149.6834	4.2400e-003	0.0237	156.8555
Vendor	2.7400e-003	0.1152	0.0272	4.0000e-004	0.0122	6.5000e-004	0.0129	3.5100e-003	6.2000e-004	4.1300e-003		42.6777	42.6777	8.1000e-004	6.4200e-003	44.6110
Worker	8.9300e-003	6.5900e-003	0.0876	2.3000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		22.9646	22.9646	6.3000e-004	6.1000e-004	23.1629
Total	**0.0179**	**0.5438**	**0.1792**	**2.0000e-003**	**0.0725**	**3.6600e-003**	**0.0761**	**0.0198**	**3.5000e-003**	**0.0233**		**215.3257**	**215.3257**	**5.6800e-003**	**0.0307**	**224.6295**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.16 Big Trees RR Crossing: Grout - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0588	0.3682	0.3084	7.1000e-004		0.0143	0.0143		0.0143	0.0143	0.0000	50.5163	50.5163	5.2400e-003		50.6474
Total	**0.0588**	**0.3682**	**0.3084**	**7.1000e-004**		**0.0143**	**0.0143**		**0.0143**	**0.0143**	**0.0000**	**50.5163**	**50.5163**	**5.2400e-003**		**50.6474**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.2400e-003	0.4220	0.0644	1.3700e-003	0.0347	2.8500e-003	0.0376	9.4900e-003	2.7300e-003	0.0122		149.6834	149.6834	4.2400e-003	0.0237	156.8555
Vendor	2.7400e-003	0.1152	0.0272	4.0000e-004	0.0122	6.5000e-004	0.0129	3.5100e-003	6.2000e-004	4.1300e-003		42.6777	42.6777	8.1000e-004	6.4200e-003	44.6110
Worker	8.9300e-003	6.5900e-003	0.0876	2.3000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		22.9646	22.9646	6.3000e-004	6.1000e-004	23.1629
Total	**0.0179**	**0.5438**	**0.1792**	**2.0000e-003**	**0.0725**	**3.6600e-003**	**0.0761**	**0.0198**	**3.5000e-003**	**0.0233**		**215.3257**	**215.3257**	**5.6800e-003**	**0.0307**	**224.6295**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.17 Big Trees RR Crossing: Backfill - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.4800e-003	0.2304	0.0544	7.9000e-004	0.0244	1.3000e-003	0.0257	7.0200e-003	1.2400e-003	8.2700e-003		85.3555	85.3555	1.6200e-003	0.0128	89.2220
Worker	8.9300e-003	6.5900e-003	0.0876	2.3000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		22.9646	22.9646	6.3000e-004	6.1000e-004	23.1629
Total	**0.0144**	**0.2370**	**0.1420**	**1.0200e-003**	**0.0500**	**1.4600e-003**	**0.0514**	**0.0138**	**1.3900e-003**	**0.0152**		**108.3200**	**108.3200**	**2.2500e-003**	**0.0135**	**112.3850**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.17 Big Trees RR Crossing: Backfill - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.4800e-003	0.2304	0.0544	7.9000e-004	0.0244	1.3000e-003	0.0257	7.0200e-003	1.2400e-003	8.2700e-003		85.3555	85.3555	1.6200e-003	0.0128	89.2220
Worker	8.9300e-003	6.5900e-003	0.0876	2.3000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		22.9646	22.9646	6.3000e-004	6.1000e-004	23.1629
Total	**0.0144**	**0.2370**	**0.1420**	**1.0200e-003**	**0.0500**	**1.4600e-003**	**0.0514**	**0.0138**	**1.3900e-003**	**0.0152**		**108.3200**	**108.3200**	**2.2500e-003**	**0.0135**	**112.3850**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.18 Zayante Creek Crossing: CIDH Piles - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2739	2.4078	2.3412	0.0102		0.0803	0.0803		0.0751	0.0751		965.9196	965.9196	0.3013		973.4522
Total	**0.2739**	**2.4078**	**2.3412**	**0.0102**		**0.0803**	**0.0803**		**0.0751**	**0.0751**		**965.9196**	**965.9196**	**0.3013**		**973.4522**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.7400e-003	0.2532	0.0386	8.2000e-004	0.0208	1.7100e-003	0.0225	5.6900e-003	1.6400e-003	7.3300e-003		89.8100	89.8100	2.5500e-003	0.0142	94.1133
Vendor	5.4800e-003	0.2304	0.0544	7.9000e-004	0.0244	1.3000e-003	0.0257	7.0200e-003	1.2400e-003	8.2700e-003		85.3555	85.3555	1.6200e-003	0.0128	89.2220
Worker	0.0357	0.0264	0.3503	9.1000e-004	0.1022	6.4000e-004	0.1028	0.0271	5.9000e-004	0.0277		91.8583	91.8583	2.5400e-003	2.4500e-003	92.6518
Total	**0.0450**	**0.5099**	**0.4434**	**2.5200e-003**	**0.1474**	**3.6500e-003**	**0.1511**	**0.0398**	**3.4700e-003**	**0.0433**		**267.0238**	**267.0238**	**6.7100e-003**	**0.0295**	**275.9871**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.18 Zayante Creek Crossing: CIDH Piles - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2739	2.4078	2.3412	0.0102		0.0803	0.0803		0.0751	0.0751	0.0000	965.9196	965.9196	0.3013		973.4522
Total	**0.2739**	**2.4078**	**2.3412**	**0.0102**		**0.0803**	**0.0803**		**0.0751**	**0.0751**	**0.0000**	**965.9196**	**965.9196**	**0.3013**		**973.4522**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.7400e-003	0.2532	0.0386	8.2000e-004	0.0208	1.7100e-003	0.0225	5.6900e-003	1.6400e-003	7.3300e-003		89.8100	89.8100	2.5500e-003	0.0142	94.1133
Vendor	5.4800e-003	0.2304	0.0544	7.9000e-004	0.0244	1.3000e-003	0.0257	7.0200e-003	1.2400e-003	8.2700e-003		85.3555	85.3555	1.6200e-003	0.0128	89.2220
Worker	0.0357	0.0264	0.3503	9.1000e-004	0.1022	6.4000e-004	0.1028	0.0271	5.9000e-004	0.0277		91.8583	91.8583	2.5400e-003	2.4500e-003	92.6518
Total	**0.0450**	**0.5099**	**0.4434**	**2.5200e-003**	**0.1474**	**3.6500e-003**	**0.1511**	**0.0398**	**3.4700e-003**	**0.0433**		**267.0238**	**267.0238**	**6.7100e-003**	**0.0295**	**275.9871**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.19 Zayante Creek Crossing: Pier scour protect - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1789	1.7099	2.3254	3.4000e-003		0.0823	0.0823		0.0763	0.0763		324.4291	324.4291	0.1000		326.9288
Total	**0.1789**	**1.7099**	**2.3254**	**3.4000e-003**		**0.0823**	**0.0823**		**0.0763**	**0.0763**		**324.4291**	**324.4291**	**0.1000**		**326.9288**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0197	1.3293	0.2029	4.3300e-003	0.1093	8.9900e-003	0.1183	0.0299	8.6000e-003	0.0385		471.5027	471.5027	0.0134	0.0747	494.0949
Vendor	8.2200e-003	0.3456	0.0816	1.1900e-003	0.0366	1.9500e-003	0.0386	0.0105	1.8700e-003	0.0124		128.0332	128.0332	2.4300e-003	0.0193	133.8331
Worker	0.0268	0.0198	0.2628	6.8000e-004	0.0766	4.8000e-004	0.0771	0.0203	4.4000e-004	0.0208		68.8937	68.8937	1.9000e-003	1.8400e-003	69.4888
Total	**0.0547**	**1.6946**	**0.5473**	**6.2000e-003**	**0.2226**	**0.0114**	**0.2340**	**0.0607**	**0.0109**	**0.0717**		**668.4296**	**668.4296**	**0.0177**	**0.0958**	**697.4168**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.19 Zayante Creek Crossing: Pier scour protect - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1789	1.7099	2.3254	3.4000e-003		0.0823	0.0823		0.0763	0.0763	0.0000	324.4291	324.4291	0.1000		326.9288
Total	**0.1789**	**1.7099**	**2.3254**	**3.4000e-003**		**0.0823**	**0.0823**		**0.0763**	**0.0763**	**0.0000**	**324.4291**	**324.4291**	**0.1000**		**326.9288**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0197	1.3293	0.2029	4.3300e-003	0.1093	8.9900e-003	0.1183	0.0299	8.6000e-003	0.0385		471.5027	471.5027	0.0134	0.0747	494.0949
Vendor	8.2200e-003	0.3456	0.0816	1.1900e-003	0.0366	1.9500e-003	0.0386	0.0105	1.8700e-003	0.0124		128.0332	128.0332	2.4300e-003	0.0193	133.8331
Worker	0.0268	0.0198	0.2628	6.8000e-004	0.0766	4.8000e-004	0.0771	0.0203	4.4000e-004	0.0208		68.8937	68.8937	1.9000e-003	1.8400e-003	69.4888
Total	**0.0547**	**1.6946**	**0.5473**	**6.2000e-003**	**0.2226**	**0.0114**	**0.2340**	**0.0607**	**0.0109**	**0.0717**		**668.4296**	**668.4296**	**0.0177**	**0.0958**	**697.4168**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.20 Zayante Creek Crossing: Pipe support - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1005	0.6912	0.7655	1.4900e-003		0.0304	0.0304		0.0304	0.0304		124.5995	124.5995	8.8900e-003		124.8219
Total	**0.1005**	**0.6912**	**0.7655**	**1.4900e-003**		**0.0304**	**0.0304**		**0.0304**	**0.0304**		**124.5995**	**124.5995**	**8.8900e-003**		**124.8219**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.2400e-003	0.4220	0.0644	1.3700e-003	0.0347	2.8500e-003	0.0376	9.4900e-003	2.7300e-003	0.0122		149.6834	149.6834	4.2400e-003	0.0237	156.8555
Vendor	2.7400e-003	0.1152	0.0272	4.0000e-004	0.0122	6.5000e-004	0.0129	3.5100e-003	6.2000e-004	4.1300e-003		42.6777	42.6777	8.1000e-004	6.4200e-003	44.6110
Worker	0.0357	0.0264	0.3503	9.1000e-004	0.1022	6.4000e-004	0.1028	0.0271	5.9000e-004	0.0277		91.8583	91.8583	2.5400e-003	2.4500e-003	92.6518
Total	**0.0447**	**0.5636**	**0.4420**	**2.6800e-003**	**0.1491**	**4.1400e-003**	**0.1533**	**0.0401**	**3.9400e-003**	**0.0440**		**284.2194**	**284.2194**	**7.5900e-003**	**0.0326**	**294.1183**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.20 Zayante Creek Crossing: Pipe support - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1005	0.6912	0.7655	1.4900e-003		0.0304	0.0304		0.0304	0.0304	0.0000	124.5995	124.5995	8.8900e-003		124.8219
Total	**0.1005**	**0.6912**	**0.7655**	**1.4900e-003**		**0.0304**	**0.0304**		**0.0304**	**0.0304**	**0.0000**	**124.5995**	**124.5995**	**8.8900e-003**		**124.8219**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.2400e-003	0.4220	0.0644	1.3700e-003	0.0347	2.8500e-003	0.0376	9.4900e-003	2.7300e-003	0.0122		149.6834	149.6834	4.2400e-003	0.0237	156.8555
Vendor	2.7400e-003	0.1152	0.0272	4.0000e-004	0.0122	6.5000e-004	0.0129	3.5100e-003	6.2000e-004	4.1300e-003		42.6777	42.6777	8.1000e-004	6.4200e-003	44.6110
Worker	0.0357	0.0264	0.3503	9.1000e-004	0.1022	6.4000e-004	0.1028	0.0271	5.9000e-004	0.0277		91.8583	91.8583	2.5400e-003	2.4500e-003	92.6518
Total	**0.0447**	**0.5636**	**0.4420**	**2.6800e-003**	**0.1491**	**4.1400e-003**	**0.1533**	**0.0401**	**3.9400e-003**	**0.0440**		**284.2194**	**284.2194**	**7.5900e-003**	**0.0326**	**294.1183**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.21 Zayante Creek Crossing: Install pipe span - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3514	3.8155	1.8344	5.7700e-003		0.1593	0.1593		0.1466	0.1466		558.8192	558.8192	0.1807		563.3376
Total	**0.3514**	**3.8155**	**1.8344**	**5.7700e-003**		**0.1593**	**0.1593**		**0.1466**	**0.1466**		**558.8192**	**558.8192**	**0.1807**		**563.3376**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7400e-003	0.1152	0.0272	4.0000e-004	0.0122	6.5000e-004	0.0129	3.5100e-003	6.2000e-004	4.1300e-003		42.6777	42.6777	8.1000e-004	6.4200e-003	44.6110
Worker	8.9300e-003	6.5900e-003	0.0876	2.3000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		22.9646	22.9646	6.3000e-004	6.1000e-004	23.1629
Total	**0.0117**	**0.1218**	**0.1148**	**6.3000e-004**	**0.0378**	**8.1000e-004**	**0.0386**	**0.0103**	**7.7000e-004**	**0.0111**		**65.6423**	**65.6423**	**1.4400e-003**	**7.0300e-003**	**67.7740**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.21 Zayante Creek Crossing: Install pipe span - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3514	3.8155	1.8344	5.7700e-003		0.1593	0.1593		0.1466	0.1466	0.0000	558.8192	558.8192	0.1807		563.3376
Total	**0.3514**	**3.8155**	**1.8344**	**5.7700e-003**		**0.1593**	**0.1593**		**0.1466**	**0.1466**	**0.0000**	**558.8192**	**558.8192**	**0.1807**		**563.3376**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7400e-003	0.1152	0.0272	4.0000e-004	0.0122	6.5000e-004	0.0129	3.5100e-003	6.2000e-004	4.1300e-003		42.6777	42.6777	8.1000e-004	6.4200e-003	44.6110
Worker	8.9300e-003	6.5900e-003	0.0876	2.3000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		22.9646	22.9646	6.3000e-004	6.1000e-004	23.1629
Total	**0.0117**	**0.1218**	**0.1148**	**6.3000e-004**	**0.0378**	**8.1000e-004**	**0.0386**	**0.0103**	**7.7000e-004**	**0.0111**		**65.6423**	**65.6423**	**1.4400e-003**	**7.0300e-003**	**67.7740**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.22 Zayante Creek Crossing: Install flex connect - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1514	1.5357	2.2313	3.1200e-003		0.0758	0.0758		0.0698	0.0698		301.5765	301.5765	0.0975		304.0149
Total	**0.1514**	**1.5357**	**2.2313**	**3.1200e-003**		**0.0758**	**0.0758**		**0.0698**	**0.0698**		**301.5765**	**301.5765**	**0.0975**		**304.0149**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.4800e-003	0.2304	0.0544	7.9000e-004	0.0244	1.3000e-003	0.0257	7.0200e-003	1.2400e-003	8.2700e-003		85.3555	85.3555	1.6200e-003	0.0128	89.2220
Worker	8.9300e-003	6.5900e-003	0.0876	2.3000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		22.9646	22.9646	6.3000e-004	6.1000e-004	23.1629
Total	**0.0144**	**0.2370**	**0.1420**	**1.0200e-003**	**0.0500**	**1.4600e-003**	**0.0514**	**0.0138**	**1.3900e-003**	**0.0152**		**108.3200**	**108.3200**	**2.2500e-003**	**0.0135**	**112.3850**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.22 Zayante Creek Crossing: Install flex connect - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1514	1.5357	2.2313	3.1200e-003		0.0758	0.0758		0.0698	0.0698	0.0000	301.5765	301.5765	0.0975		304.0149
Total	**0.1514**	**1.5357**	**2.2313**	**3.1200e-003**		**0.0758**	**0.0758**		**0.0698**	**0.0698**	**0.0000**	**301.5765**	**301.5765**	**0.0975**		**304.0149**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.4800e-003	0.2304	0.0544	7.9000e-004	0.0244	1.3000e-003	0.0257	7.0200e-003	1.2400e-003	8.2700e-003		85.3555	85.3555	1.6200e-003	0.0128	89.2220
Worker	8.9300e-003	6.5900e-003	0.0876	2.3000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		22.9646	22.9646	6.3000e-004	6.1000e-004	23.1629
Total	**0.0144**	**0.2370**	**0.1420**	**1.0200e-003**	**0.0500**	**1.4600e-003**	**0.0514**	**0.0138**	**1.3900e-003**	**0.0152**		**108.3200**	**108.3200**	**2.2500e-003**	**0.0135**	**112.3850**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.23 Zayante Creek Crossing: Grade for drainage - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1514	1.5357	2.2313	3.1200e-003		0.0758	0.0758		0.0698	0.0698		301.5765	301.5765	0.0975		304.0149
Total	**0.1514**	**1.5357**	**2.2313**	**3.1200e-003**	**0.0000**	**0.0758**	**0.0758**	**0.0000**	**0.0698**	**0.0698**		**301.5765**	**301.5765**	**0.0975**		**304.0149**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7400e-003	0.1152	0.0272	4.0000e-004	0.0122	6.5000e-004	0.0129	3.5100e-003	6.2000e-004	4.1300e-003		42.6777	42.6777	8.1000e-004	6.4200e-003	44.6110
Worker	0.0268	0.0198	0.2628	6.8000e-004	0.0766	4.8000e-004	0.0771	0.0203	4.4000e-004	0.0208		68.8937	68.8937	1.9000e-003	1.8400e-003	69.4888
Total	**0.0295**	**0.1350**	**0.2900**	**1.0800e-003**	**0.0889**	**1.1300e-003**	**0.0900**	**0.0238**	**1.0600e-003**	**0.0249**		**111.5714**	**111.5714**	**2.7100e-003**	**8.2600e-003**	**114.0998**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.23 Zayante Creek Crossing: Grade for drainage - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1514	1.5357	2.2313	3.1200e-003		0.0758	0.0758		0.0698	0.0698	0.0000	301.5765	301.5765	0.0975		304.0149
Total	**0.1514**	**1.5357**	**2.2313**	**3.1200e-003**	**0.0000**	**0.0758**	**0.0758**	**0.0000**	**0.0698**	**0.0698**	**0.0000**	**301.5765**	**301.5765**	**0.0975**		**304.0149**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7400e-003	0.1152	0.0272	4.0000e-004	0.0122	6.5000e-004	0.0129	3.5100e-003	6.2000e-004	4.1300e-003		42.6777	42.6777	8.1000e-004	6.4200e-003	44.6110
Worker	0.0268	0.0198	0.2628	6.8000e-004	0.0766	4.8000e-004	0.0771	0.0203	4.4000e-004	0.0208		68.8937	68.8937	1.9000e-003	1.8400e-003	69.4888
Total	**0.0295**	**0.1350**	**0.2900**	**1.0800e-003**	**0.0889**	**1.1300e-003**	**0.0900**	**0.0238**	**1.0600e-003**	**0.0249**		**111.5714**	**111.5714**	**2.7100e-003**	**8.2600e-003**	**114.0998**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.24 FBPS to Zayante: Road removal/pipe install - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0240	0.0000	0.0240	3.3600e-003	0.0000	3.3600e-003			0.0000			0.0000
Off-Road	0.2548	2.1147	3.6448	5.8700e-003		0.1013	0.1013		0.0951	0.0951		559.0095	559.0095	0.1548		562.8787
Total	**0.2548**	**2.1147**	**3.6448**	**5.8700e-003**	**0.0240**	**0.1013**	**0.1253**	**3.3600e-003**	**0.0951**	**0.0984**		**559.0095**	**559.0095**	**0.1548**		**562.8787**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1689	11.4221	1.7431	0.0372	0.9395	0.0773	1.0168	0.2569	0.0739	0.3308		4,051.4304	4,051.4304	0.1148	0.6418	4,245.5564
Vendor	0.0795	3.3403	0.7892	0.0115	0.3540	0.0189	0.3729	0.1018	0.0181	0.1199		1,237.6540	1,237.6540	0.0235	0.1862	1,293.7196
Worker	0.1429	0.1055	1.4014	3.6300e-003	0.4087	2.5400e-003	0.4113	0.1084	2.3400e-003	0.1107		367.4331	367.4331	0.0102	9.8000e-003	370.6070
Total	**0.3912**	**14.8679**	**3.9336**	**0.0524**	**1.7022**	**0.0987**	**1.8009**	**0.4671**	**0.0943**	**0.5614**		**5,656.5175**	**5,656.5175**	**0.1485**	**0.8378**	**5,909.8830**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.24 FBPS to Zayante: Road removal/pipe install - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0108	0.0000	0.0108	1.5100e-003	0.0000	1.5100e-003			0.0000			0.0000
Off-Road	0.2548	2.1147	3.6448	5.8700e-003		0.1013	0.1013		0.0951	0.0951	0.0000	559.0095	559.0095	0.1548		562.8787
Total	**0.2548**	**2.1147**	**3.6448**	**5.8700e-003**	**0.0108**	**0.1013**	**0.1121**	**1.5100e-003**	**0.0951**	**0.0966**	**0.0000**	**559.0095**	**559.0095**	**0.1548**		**562.8787**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1689	11.4221	1.7431	0.0372	0.9395	0.0773	1.0168	0.2569	0.0739	0.3308		4,051.4304	4,051.4304	0.1148	0.6418	4,245.5564
Vendor	0.0795	3.3403	0.7892	0.0115	0.3540	0.0189	0.3729	0.1018	0.0181	0.1199		1,237.6540	1,237.6540	0.0235	0.1862	1,293.7196
Worker	0.1429	0.1055	1.4014	3.6300e-003	0.4087	2.5400e-003	0.4113	0.1084	2.3400e-003	0.1107		367.4331	367.4331	0.0102	9.8000e-003	370.6070
Total	**0.3912**	**14.8679**	**3.9336**	**0.0524**	**1.7022**	**0.0987**	**1.8009**	**0.4671**	**0.0943**	**0.5614**		**5,656.5175**	**5,656.5175**	**0.1485**	**0.8378**	**5,909.8830**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.25 Zayante to Big Trees RR: Road removal/pipe install - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0385	0.0000	0.0385	5.3100e-003	0.0000	5.3100e-003			0.0000			0.0000
Off-Road	0.2548	2.1147	3.6448	5.8700e-003		0.1013	0.1013		0.0951	0.0951		559.0095	559.0095	0.1548		562.8787
Total	**0.2548**	**2.1147**	**3.6448**	**5.8700e-003**	**0.0385**	**0.1013**	**0.1398**	**5.3100e-003**	**0.0951**	**0.1004**		**559.0095**	**559.0095**	**0.1548**		**562.8787**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2534	17.1402	2.6157	0.0558	1.4098	0.1160	1.5258	0.3855	0.1109	0.4964		6,079.6403	6,079.6403	0.1723	0.9631	6,370.9489
Vendor	0.1165	4.8953	1.1565	0.0169	0.5188	0.0277	0.5464	0.1492	0.0265	0.1757		1,813.8033	1,813.8033	0.0344	0.2728	1,895.9684
Worker	0.1608	0.1187	1.5765	4.0900e-003	0.4598	2.8600e-003	0.4627	0.1219	2.6400e-003	0.1246		413.3623	413.3623	0.0114	0.0110	416.9329
Total	**0.5306**	**22.1542**	**5.3488**	**0.0768**	**2.3884**	**0.1465**	**2.5349**	**0.6566**	**0.1400**	**0.7967**		**8,306.8059**	**8,306.8059**	**0.2182**	**1.2469**	**8,683.8501**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.25 Zayante to Big Trees RR: Road removal/pipe install - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0173	0.0000	0.0173	2.3900e-003	0.0000	2.3900e-003			0.0000			0.0000
Off-Road	0.2548	2.1147	3.6448	5.8700e-003		0.1013	0.1013		0.0951	0.0951	0.0000	559.0095	559.0095	0.1548		562.8787
Total	**0.2548**	**2.1147**	**3.6448**	**5.8700e-003**	**0.0173**	**0.1013**	**0.1186**	**2.3900e-003**	**0.0951**	**0.0974**	**0.0000**	**559.0095**	**559.0095**	**0.1548**		**562.8787**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2534	17.1402	2.6157	0.0558	1.4098	0.1160	1.5258	0.3855	0.1109	0.4964		6,079.6403	6,079.6403	0.1723	0.9631	6,370.9489
Vendor	0.1165	4.8953	1.1565	0.0169	0.5188	0.0277	0.5464	0.1492	0.0265	0.1757		1,813.8033	1,813.8033	0.0344	0.2728	1,895.9684
Worker	0.1608	0.1187	1.5765	4.0900e-003	0.4598	2.8600e-003	0.4627	0.1219	2.6400e-003	0.1246		413.3623	413.3623	0.0114	0.0110	416.9329
Total	**0.5306**	**22.1542**	**5.3488**	**0.0768**	**2.3884**	**0.1465**	**2.5349**	**0.6566**	**0.1400**	**0.7967**		**8,306.8059**	**8,306.8059**	**0.2182**	**1.2469**	**8,683.8501**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.26 GH Rd North: Road removal/pipe install - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0892	0.0000	0.0892	0.0104	0.0000	0.0104			0.0000			0.0000
Off-Road	0.2439	1.9594	3.6510	5.8700e-003		0.0915	0.0915		0.0858	0.0858		559.2869	559.2869	0.1547		563.1551
Total	**0.2439**	**1.9594**	**3.6510**	**5.8700e-003**	**0.0892**	**0.0915**	**0.1806**	**0.0104**	**0.0858**	**0.0962**		**559.2869**	**559.2869**	**0.1547**		**563.1551**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1633	10.9003	1.7543	0.0364	0.9400	0.0747	1.0147	0.2570	0.0715	0.3285		3,968.4044	3,968.4044	0.1151	0.6287	4,158.6295
Vendor	0.1020	4.3510	1.0321	0.0152	0.4761	0.0246	0.5007	0.1370	0.0235	0.1605		1,635.6425	1,635.6425	0.0314	0.2460	1,709.7219
Worker	0.1420	0.0992	1.3675	3.7400e-003	0.4343	2.5400e-003	0.4368	0.1152	2.3500e-003	0.1175		378.3097	378.3097	9.6800e-003	9.5900e-003	381.4104
Total	**0.4072**	**15.3505**	**4.1539**	**0.0554**	**1.8503**	**0.1018**	**1.9522**	**0.5091**	**0.0974**	**0.6065**		**5,982.3566**	**5,982.3566**	**0.1562**	**0.8842**	**6,249.7617**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.26 GH Rd North: Road removal/pipe install - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0401	0.0000	0.0401	4.6800e-003	0.0000	4.6800e-003			0.0000			0.0000
Off-Road	0.2439	1.9594	3.6510	5.8700e-003		0.0915	0.0915		0.0858	0.0858	0.0000	559.2869	559.2869	0.1547		563.1551
Total	**0.2439**	**1.9594**	**3.6510**	**5.8700e-003**	**0.0401**	**0.0915**	**0.1316**	**4.6800e-003**	**0.0858**	**0.0905**	**0.0000**	**559.2869**	**559.2869**	**0.1547**		**563.1551**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1633	10.9003	1.7543	0.0364	0.9400	0.0747	1.0147	0.2570	0.0715	0.3285		3,968.4044	3,968.4044	0.1151	0.6287	4,158.6295
Vendor	0.1020	4.3510	1.0321	0.0152	0.4761	0.0246	0.5007	0.1370	0.0235	0.1605		1,635.6425	1,635.6425	0.0314	0.2460	1,709.7219
Worker	0.1420	0.0992	1.3675	3.7400e-003	0.4343	2.5400e-003	0.4368	0.1152	2.3500e-003	0.1175		378.3097	378.3097	9.6800e-003	9.5900e-003	381.4104
Total	**0.4072**	**15.3505**	**4.1539**	**0.0554**	**1.8503**	**0.1018**	**1.9522**	**0.5091**	**0.0974**	**0.6065**		**5,982.3566**	**5,982.3566**	**0.1562**	**0.8842**	**6,249.7617**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.27 FBPS to Zayante: Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252		1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	28.0340					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**28.5826**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**		**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1357	9.0582	1.4578	0.0303	0.7811	0.0621	0.8432	0.2136	0.0594	0.2730		3,297.7508	3,297.7508	0.0957	0.5224	3,455.8281
Vendor	0.0654	2.7891	0.6616	9.7600e-003	0.3052	0.0158	0.3209	0.0878	0.0151	0.1029		1,048.4888	1,048.4888	0.0201	0.1577	1,095.9756
Worker	0.0919	0.0642	0.8849	2.4200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		244.7887	244.7887	6.2600e-003	6.2100e-003	246.7949
Total	**0.2929**	**11.9114**	**3.0043**	**0.0425**	**1.3673**	**0.0795**	**1.4468**	**0.3759**	**0.0760**	**0.4519**		**4,591.0282**	**4,591.0282**	**0.1220**	**0.6863**	**4,798.5986**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.27 FBPS to Zayante: Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252	0.0000	1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	28.0340					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**28.5826**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**	**0.0000**	**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1357	9.0582	1.4578	0.0303	0.7811	0.0621	0.8432	0.2136	0.0594	0.2730		3,297.7508	3,297.7508	0.0957	0.5224	3,455.8281
Vendor	0.0654	2.7891	0.6616	9.7600e-003	0.3052	0.0158	0.3209	0.0878	0.0151	0.1029		1,048.4888	1,048.4888	0.0201	0.1577	1,095.9756
Worker	0.0919	0.0642	0.8849	2.4200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		244.7887	244.7887	6.2600e-003	6.2100e-003	246.7949
Total	**0.2929**	**11.9114**	**3.0043**	**0.0425**	**1.3673**	**0.0795**	**1.4468**	**0.3759**	**0.0760**	**0.4519**		**4,591.0282**	**4,591.0282**	**0.1220**	**0.6863**	**4,798.5986**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.28 Zayante to Big Trees RR: Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252		1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	28.0340					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**28.5826**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**		**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2020	13.4866	2.1706	0.0451	1.1630	0.0924	1.2554	0.3180	0.0884	0.4064		4,909.9845	4,909.9845	0.1424	0.7779	5,145.3441
Vendor	0.0941	4.0163	0.9527	0.0141	0.4395	0.0227	0.4622	0.1264	0.0217	0.1481		1,509.8238	1,509.8238	0.0290	0.2270	1,578.2048
Worker	0.0919	0.0642	0.8849	2.4200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		244.7887	244.7887	6.2600e-003	6.2100e-003	246.7949
Total	**0.3880**	**17.5671**	**4.0081**	**0.0616**	**1.8834**	**0.1168**	**2.0002**	**0.5189**	**0.1117**	**0.6306**		**6,664.5969**	**6,664.5969**	**0.1776**	**1.0111**	**6,970.3438**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.28 Zayante to Big Trees RR: Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252	0.0000	1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	28.0340					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**28.5826**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**	**0.0000**	**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2020	13.4866	2.1706	0.0451	1.1630	0.0924	1.2554	0.3180	0.0884	0.4064		4,909.9845	4,909.9845	0.1424	0.7779	5,145.3441
Vendor	0.0941	4.0163	0.9527	0.0141	0.4395	0.0227	0.4622	0.1264	0.0217	0.1481		1,509.8238	1,509.8238	0.0290	0.2270	1,578.2048
Worker	0.0919	0.0642	0.8849	2.4200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		244.7887	244.7887	6.2600e-003	6.2100e-003	246.7949
Total	**0.3880**	**17.5671**	**4.0081**	**0.0616**	**1.8834**	**0.1168**	**2.0002**	**0.5189**	**0.1117**	**0.6306**		**6,664.5969**	**6,664.5969**	**0.1776**	**1.0111**	**6,970.3438**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.29 GH Rd North: Pressure test - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3059	2.5785	3.7198	6.5800e-003		0.1173	0.1173		0.1173	0.1173		623.0346	623.0346	0.0274		623.7198
Total	**0.3059**	**2.5785**	**3.7198**	**6.5800e-003**		**0.1173**	**0.1173**		**0.1173**	**0.1173**		**623.0346**	**623.0346**	**0.0274**		**623.7198**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.2300e-003	0.2231	0.0529	7.8000e-004	0.0244	1.2600e-003	0.0257	7.0200e-003	1.2100e-003	8.2300e-003		83.8791	83.8791	1.6100e-003	0.0126	87.6781
Worker	0.0167	0.0117	0.1609	4.4000e-004	0.0511	3.0000e-004	0.0514	0.0136	2.8000e-004	0.0138		44.5070	44.5070	1.1400e-003	1.1300e-003	44.8718
Total	**0.0219**	**0.2348**	**0.2138**	**1.2200e-003**	**0.0755**	**1.5600e-003**	**0.0771**	**0.0206**	**1.4900e-003**	**0.0221**		**128.3861**	**128.3861**	**2.7500e-003**	**0.0137**	**132.5499**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.29 GH Rd North: Pressure test - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3059	2.5785	3.7198	6.5800e-003		0.1173	0.1173		0.1173	0.1173	0.0000	623.0346	623.0346	0.0274		623.7198
Total	**0.3059**	**2.5785**	**3.7198**	**6.5800e-003**		**0.1173**	**0.1173**		**0.1173**	**0.1173**	**0.0000**	**623.0346**	**623.0346**	**0.0274**		**623.7198**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.2300e-003	0.2231	0.0529	7.8000e-004	0.0244	1.2600e-003	0.0257	7.0200e-003	1.2100e-003	8.2300e-003		83.8791	83.8791	1.6100e-003	0.0126	87.6781
Worker	0.0167	0.0117	0.1609	4.4000e-004	0.0511	3.0000e-004	0.0514	0.0136	2.8000e-004	0.0138		44.5070	44.5070	1.1400e-003	1.1300e-003	44.8718
Total	**0.0219**	**0.2348**	**0.2138**	**1.2200e-003**	**0.0755**	**1.5600e-003**	**0.0771**	**0.0206**	**1.4900e-003**	**0.0221**		**128.3861**	**128.3861**	**2.7500e-003**	**0.0137**	**132.5499**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.30 GH Rd North: Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252		1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	2.8034					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**3.3520**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**		**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1354	9.0380	1.4546	0.0302	0.7794	0.0620	0.8413	0.2131	0.0593	0.2724		3,290.4224	3,290.4224	0.0955	0.5213	3,448.1485
Vendor	0.0654	2.7891	0.6616	9.7600e-003	0.3052	0.0158	0.3209	0.0878	0.0151	0.1029		1,048.4888	1,048.4888	0.0201	0.1577	1,095.9756
Worker	0.0919	0.0642	0.8849	2.4200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		244.7887	244.7887	6.2600e-003	6.2100e-003	246.7949
Total	**0.2926**	**11.8913**	**3.0010**	**0.0424**	**1.3656**	**0.0794**	**1.4449**	**0.3754**	**0.0759**	**0.4513**		**4,583.6998**	**4,583.6998**	**0.1218**	**0.6852**	**4,790.9190**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.30 GH Rd North: Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252	0.0000	1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	2.8034					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**3.3520**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**	**0.0000**	**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1354	9.0380	1.4546	0.0302	0.7794	0.0620	0.8413	0.2131	0.0593	0.2724		3,290.4224	3,290.4224	0.0955	0.5213	3,448.1485
Vendor	0.0654	2.7891	0.6616	9.7600e-003	0.3052	0.0158	0.3209	0.0878	0.0151	0.1029		1,048.4888	1,048.4888	0.0201	0.1577	1,095.9756
Worker	0.0919	0.0642	0.8849	2.4200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		244.7887	244.7887	6.2600e-003	6.2100e-003	246.7949
Total	**0.2926**	**11.8913**	**3.0010**	**0.0424**	**1.3656**	**0.0794**	**1.4449**	**0.3754**	**0.0759**	**0.4513**		**4,583.6998**	**4,583.6998**	**0.1218**	**0.6852**	**4,790.9190**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.31 GH Rd South: Road removal/pipe install - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0595	0.0000	0.0595	7.9600e-003	0.0000	7.9600e-003			0.0000			0.0000
Off-Road	0.2439	1.9594	3.6510	5.8700e-003		0.0915	0.0915		0.0858	0.0858		559.2869	559.2869	0.1547		563.1551
Total	**0.2439**	**1.9594**	**3.6510**	**5.8700e-003**	**0.0595**	**0.0915**	**0.1510**	**7.9600e-003**	**0.0858**	**0.0938**		**559.2869**	**559.2869**	**0.1547**		**563.1551**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3266	21.8000	3.5085	0.0729	1.8798	0.1494	2.0293	0.5140	0.1430	0.6570		7,936.5868	7,936.5868	0.2302	1.2573	8,317.0263
Vendor	0.1464	6.2476	1.4819	0.0219	0.6836	0.0353	0.7189	0.1967	0.0338	0.2304		2,348.6148	2,348.6148	0.0450	0.3532	2,454.9853
Worker	0.1420	0.0992	1.3675	3.7400e-003	0.4343	2.5400e-003	0.4368	0.1152	2.3500e-003	0.1175		378.3097	378.3097	9.6800e-003	9.5900e-003	381.4104
Total	**0.6150**	**28.1468**	**6.3580**	**0.0985**	**2.9977**	**0.1873**	**3.1850**	**0.8258**	**0.1791**	**1.0049**		**10,663.5114**	**10,663.5114**	**0.2849**	**1.6201**	**11,153.4219**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.31 GH Rd South: Road removal/pipe install - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0268	0.0000	0.0268	3.5800e-003	0.0000	3.5800e-003			0.0000			0.0000
Off-Road	0.2439	1.9594	3.6510	5.8700e-003		0.0915	0.0915		0.0858	0.0858	0.0000	559.2869	559.2869	0.1547		563.1551
Total	**0.2439**	**1.9594**	**3.6510**	**5.8700e-003**	**0.0268**	**0.0915**	**0.1182**	**3.5800e-003**	**0.0858**	**0.0894**	**0.0000**	**559.2869**	**559.2869**	**0.1547**		**563.1551**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3266	21.8000	3.5085	0.0729	1.8798	0.1494	2.0293	0.5140	0.1430	0.6570		7,936.5868	7,936.5868	0.2302	1.2573	8,317.0263
Vendor	0.1464	6.2476	1.4819	0.0219	0.6836	0.0353	0.7189	0.1967	0.0338	0.2304		2,348.6148	2,348.6148	0.0450	0.3532	2,454.9853
Worker	0.1420	0.0992	1.3675	3.7400e-003	0.4343	2.5400e-003	0.4368	0.1152	2.3500e-003	0.1175		378.3097	378.3097	9.6800e-003	9.5900e-003	381.4104
Total	**0.6150**	**28.1468**	**6.3580**	**0.0985**	**2.9977**	**0.1873**	**3.1850**	**0.8258**	**0.1791**	**1.0049**		**10,663.5114**	**10,663.5114**	**0.2849**	**1.6201**	**11,153.4219**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.32 GH Rd North: Tie in to FBPS - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6100e-003	0.1116	0.0265	3.9000e-004	0.0122	6.3000e-004	0.0128	3.5100e-003	6.0000e-004	4.1100e-003		41.9396	41.9396	8.0000e-004	6.3100e-003	43.8390
Worker	8.3500e-003	5.8300e-003	0.0804	2.2000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		22.2535	22.2535	5.7000e-004	5.6000e-004	22.4359
Total	**0.0110**	**0.1174**	**0.1069**	**6.1000e-004**	**0.0378**	**7.8000e-004**	**0.0385**	**0.0103**	**7.4000e-004**	**0.0110**		**64.1931**	**64.1931**	**1.3700e-003**	**6.8700e-003**	**66.2749**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.32 GH Rd North: Tie in to FBPS - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6100e-003	0.1116	0.0265	3.9000e-004	0.0122	6.3000e-004	0.0128	3.5100e-003	6.0000e-004	4.1100e-003		41.9396	41.9396	8.0000e-004	6.3100e-003	43.8390
Worker	8.3500e-003	5.8300e-003	0.0804	2.2000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		22.2535	22.2535	5.7000e-004	5.6000e-004	22.4359
Total	**0.0110**	**0.1174**	**0.1069**	**6.1000e-004**	**0.0378**	**7.8000e-004**	**0.0385**	**0.0103**	**7.4000e-004**	**0.0110**		**64.1931**	**64.1931**	**1.3700e-003**	**6.8700e-003**	**66.2749**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.33 GH Rd South: Test pipeline - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3059	2.5785	3.7198	6.5800e-003		0.1173	0.1173		0.1173	0.1173		623.0346	623.0346	0.0274		623.7198
Total	**0.3059**	**2.5785**	**3.7198**	**6.5800e-003**		**0.1173**	**0.1173**		**0.1173**	**0.1173**		**623.0346**	**623.0346**	**0.0274**		**623.7198**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.2300e-003	0.2231	0.0529	7.8000e-004	0.0244	1.2600e-003	0.0257	7.0200e-003	1.2100e-003	8.2300e-003		83.8791	83.8791	1.6100e-003	0.0126	87.6781
Worker	0.0167	0.0117	0.1609	4.4000e-004	0.0511	3.0000e-004	0.0514	0.0136	2.8000e-004	0.0138		44.5070	44.5070	1.1400e-003	1.1300e-003	44.8718
Total	**0.0219**	**0.2348**	**0.2138**	**1.2200e-003**	**0.0755**	**1.5600e-003**	**0.0771**	**0.0206**	**1.4900e-003**	**0.0221**		**128.3861**	**128.3861**	**2.7500e-003**	**0.0137**	**132.5499**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.33 GH Rd South: Test pipeline - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3059	2.5785	3.7198	6.5800e-003		0.1173	0.1173		0.1173	0.1173	0.0000	623.0346	623.0346	0.0274		623.7198
Total	**0.3059**	**2.5785**	**3.7198**	**6.5800e-003**		**0.1173**	**0.1173**		**0.1173**	**0.1173**	**0.0000**	**623.0346**	**623.0346**	**0.0274**		**623.7198**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.2300e-003	0.2231	0.0529	7.8000e-004	0.0244	1.2600e-003	0.0257	7.0200e-003	1.2100e-003	8.2300e-003		83.8791	83.8791	1.6100e-003	0.0126	87.6781
Worker	0.0167	0.0117	0.1609	4.4000e-004	0.0511	3.0000e-004	0.0514	0.0136	2.8000e-004	0.0138		44.5070	44.5070	1.1400e-003	1.1300e-003	44.8718
Total	**0.0219**	**0.2348**	**0.2138**	**1.2200e-003**	**0.0755**	**1.5600e-003**	**0.0771**	**0.0206**	**1.4900e-003**	**0.0221**		**128.3861**	**128.3861**	**2.7500e-003**	**0.0137**	**132.5499**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.34 GH Rd South: Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252		1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	5.6068					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**6.1554**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**		**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2708	18.0761	2.9092	0.0604	1.5587	0.1239	1.6826	0.4262	0.1185	0.5447		6,580.8448	6,580.8448	0.1909	1.0426	6,896.2970
Vendor	0.1216	5.1877	1.2305	0.0182	0.5676	0.0293	0.5970	0.1633	0.0280	0.1913		1,950.1891	1,950.1891	0.0374	0.2933	2,038.5146
Worker	0.0919	0.0642	0.8849	2.4200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		244.7887	244.7887	6.2600e-003	6.2100e-003	246.7949
Total	**0.4842**	**23.3280**	**5.0246**	**0.0810**	**2.4074**	**0.1549**	**2.5622**	**0.6640**	**0.1481**	**0.8121**		**8,775.8226**	**8,775.8226**	**0.2346**	**1.3420**	**9,181.6065**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.34 GH Rd South: Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252	0.0000	1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	5.6068					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**6.1554**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**	**0.0000**	**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2708	18.0761	2.9092	0.0604	1.5587	0.1239	1.6826	0.4262	0.1185	0.5447		6,580.8448	6,580.8448	0.1909	1.0426	6,896.2970
Vendor	0.1216	5.1877	1.2305	0.0182	0.5676	0.0293	0.5970	0.1633	0.0280	0.1913		1,950.1891	1,950.1891	0.0374	0.2933	2,038.5146
Worker	0.0919	0.0642	0.8849	2.4200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		244.7887	244.7887	6.2600e-003	6.2100e-003	246.7949
Total	**0.4842**	**23.3280**	**5.0246**	**0.0810**	**2.4074**	**0.1549**	**2.5622**	**0.6640**	**0.1481**	**0.8121**		**8,775.8226**	**8,775.8226**	**0.2346**	**1.3420**	**9,181.6065**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.35 GH Rd South: GHWTP tie in - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1439	1.4483	2.2356	3.1200e-003		0.0665	0.0665		0.0612	0.0612		301.7667	301.7667	0.0976		304.2067
Total	**0.1439**	**1.4483**	**2.2356**	**3.1200e-003**		**0.0665**	**0.0665**		**0.0612**	**0.0612**		**301.7667**	**301.7667**	**0.0976**		**304.2067**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6100e-003	0.1116	0.0265	3.9000e-004	0.0122	6.3000e-004	0.0128	3.5100e-003	6.0000e-004	4.1100e-003		41.9396	41.9396	8.0000e-004	6.3100e-003	43.8390
Worker	8.3500e-003	5.8300e-003	0.0804	2.2000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		22.2535	22.2535	5.7000e-004	5.6000e-004	22.4359
Total	**0.0110**	**0.1174**	**0.1069**	**6.1000e-004**	**0.0378**	**7.8000e-004**	**0.0385**	**0.0103**	**7.4000e-004**	**0.0110**		**64.1931**	**64.1931**	**1.3700e-003**	**6.8700e-003**	**66.2749**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.35 GH Rd South: GHWTP tie in - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1439	1.4483	2.2356	3.1200e-003		0.0665	0.0665		0.0612	0.0612	0.0000	301.7667	301.7667	0.0976		304.2067
Total	**0.1439**	**1.4483**	**2.2356**	**3.1200e-003**		**0.0665**	**0.0665**		**0.0612**	**0.0612**	**0.0000**	**301.7667**	**301.7667**	**0.0976**		**304.2067**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6100e-003	0.1116	0.0265	3.9000e-004	0.0122	6.3000e-004	0.0128	3.5100e-003	6.0000e-004	4.1100e-003		41.9396	41.9396	8.0000e-004	6.3100e-003	43.8390
Worker	8.3500e-003	5.8300e-003	0.0804	2.2000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		22.2535	22.2535	5.7000e-004	5.6000e-004	22.4359
Total	**0.0110**	**0.1174**	**0.1069**	**6.1000e-004**	**0.0378**	**7.8000e-004**	**0.0385**	**0.0103**	**7.4000e-004**	**0.0110**		**64.1931**	**64.1931**	**1.3700e-003**	**6.8700e-003**	**66.2749**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.36 GH Rd South: Pavement striping - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	38.8867					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1861	2.0563	1.6249	6.7600e-003		0.0778	0.0778		0.0716	0.0716		654.3830	654.3830	0.2116		659.6740
Total	**39.0729**	**2.0563**	**1.6249**	**6.7600e-003**		**0.0778**	**0.0778**		**0.0716**	**0.0716**		**654.3830**	**654.3830**	**0.2116**		**659.6740**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6100e-003	0.1116	0.0265	3.9000e-004	0.0122	6.3000e-004	0.0128	3.5100e-003	6.0000e-004	4.1100e-003		41.9396	41.9396	8.0000e-004	6.3100e-003	43.8390
Worker	8.3500e-003	5.8300e-003	0.0804	2.2000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		22.2535	22.2535	5.7000e-004	5.6000e-004	22.4359
Total	**0.0110**	**0.1174**	**0.1069**	**6.1000e-004**	**0.0378**	**7.8000e-004**	**0.0385**	**0.0103**	**7.4000e-004**	**0.0110**		**64.1931**	**64.1931**	**1.3700e-003**	**6.8700e-003**	**66.2749**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.36 GH Rd South: Pavement striping - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	38.8867					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1861	2.0563	1.6249	6.7600e-003		0.0778	0.0778		0.0716	0.0716	0.0000	654.3830	654.3830	0.2116		659.6740
Total	**39.0729**	**2.0563**	**1.6249**	**6.7600e-003**		**0.0778**	**0.0778**		**0.0716**	**0.0716**	**0.0000**	**654.3830**	**654.3830**	**0.2116**		**659.6740**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6100e-003	0.1116	0.0265	3.9000e-004	0.0122	6.3000e-004	0.0128	3.5100e-003	6.0000e-004	4.1100e-003		41.9396	41.9396	8.0000e-004	6.3100e-003	43.8390
Worker	8.3500e-003	5.8300e-003	0.0804	2.2000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		22.2535	22.2535	5.7000e-004	5.6000e-004	22.4359
Total	**0.0110**	**0.1174**	**0.1069**	**6.1000e-004**	**0.0378**	**7.8000e-004**	**0.0385**	**0.0103**	**7.4000e-004**	**0.0110**		**64.1931**	**64.1931**	**1.3700e-003**	**6.8700e-003**	**66.2749**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.37 GH Rd South: Cathodic protection - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1861	2.0563	1.6249	6.7600e-003		0.0778	0.0778		0.0716	0.0716		654.3830	654.3830	0.2116		659.6740
Total	**0.1861**	**2.0563**	**1.6249**	**6.7600e-003**		**0.0778**	**0.0778**		**0.0716**	**0.0716**		**654.3830**	**654.3830**	**0.2116**		**659.6740**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6100e-003	0.1116	0.0265	3.9000e-004	0.0122	6.3000e-004	0.0128	3.5100e-003	6.0000e-004	4.1100e-003		41.9396	41.9396	8.0000e-004	6.3100e-003	43.8390
Worker	8.3500e-003	5.8300e-003	0.0804	2.2000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		22.2535	22.2535	5.7000e-004	5.6000e-004	22.4359
Total	**0.0110**	**0.1174**	**0.1069**	**6.1000e-004**	**0.0378**	**7.8000e-004**	**0.0385**	**0.0103**	**7.4000e-004**	**0.0110**		**64.1931**	**64.1931**	**1.3700e-003**	**6.8700e-003**	**66.2749**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.37 GH Rd South: Cathodic protection - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1861	2.0563	1.6249	6.7600e-003		0.0778	0.0778		0.0716	0.0716	0.0000	654.3830	654.3830	0.2116		659.6740
Total	**0.1861**	**2.0563**	**1.6249**	**6.7600e-003**		**0.0778**	**0.0778**		**0.0716**	**0.0716**	**0.0000**	**654.3830**	**654.3830**	**0.2116**		**659.6740**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6100e-003	0.1116	0.0265	3.9000e-004	0.0122	6.3000e-004	0.0128	3.5100e-003	6.0000e-004	4.1100e-003		41.9396	41.9396	8.0000e-004	6.3100e-003	43.8390
Worker	8.3500e-003	5.8300e-003	0.0804	2.2000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		22.2535	22.2535	5.7000e-004	5.6000e-004	22.4359
Total	**0.0110**	**0.1174**	**0.1069**	**6.1000e-004**	**0.0378**	**7.8000e-004**	**0.0385**	**0.0103**	**7.4000e-004**	**0.0110**		**64.1931**	**64.1931**	**1.3700e-003**	**6.8700e-003**	**66.2749**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.38 Abandon Existing NCP: Outside Henry Cowell - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1282	0.8757	0.7231	1.5800e-003		0.0345	0.0345		0.0339	0.0339		130.2339	130.2339	0.0220		130.7843
Total	**0.1282**	**0.8757**	**0.7231**	**1.5800e-003**		**0.0345**	**0.0345**		**0.0339**	**0.0339**		**130.2339**	**130.2339**	**0.0220**		**130.7843**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0348	2.3216	0.3736	7.7600e-003	0.2002	0.0159	0.2161	0.0547	0.0152	0.0700		845.2013	845.2013	0.0245	0.1339	885.7159
Vendor	0.0183	0.7810	0.1852	2.7300e-003	0.0855	4.4100e-003	0.0899	0.0246	4.2200e-003	0.0288		293.5769	293.5769	5.6300e-003	0.0442	306.8732
Worker	0.0251	0.0175	0.2413	6.6000e-004	0.0766	4.5000e-004	0.0771	0.0203	4.1000e-004	0.0207		66.7605	66.7605	1.7100e-003	1.6900e-003	67.3077
Total	**0.0781**	**3.1200**	**0.8002**	**0.0112**	**0.3623**	**0.0208**	**0.3831**	**0.0996**	**0.0199**	**0.1195**		**1,205.5387**	**1,205.5387**	**0.0319**	**0.1797**	**1,259.8968**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.38 Abandon Existing NCP: Outside Henry Cowell - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1282	0.8757	0.7231	1.5800e-003		0.0345	0.0345		0.0339	0.0339	0.0000	130.2339	130.2339	0.0220		130.7843
Total	**0.1282**	**0.8757**	**0.7231**	**1.5800e-003**		**0.0345**	**0.0345**		**0.0339**	**0.0339**	**0.0000**	**130.2339**	**130.2339**	**0.0220**		**130.7843**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0348	2.3216	0.3736	7.7600e-003	0.2002	0.0159	0.2161	0.0547	0.0152	0.0700		845.2013	845.2013	0.0245	0.1339	885.7159
Vendor	0.0183	0.7810	0.1852	2.7300e-003	0.0855	4.4100e-003	0.0899	0.0246	4.2200e-003	0.0288		293.5769	293.5769	5.6300e-003	0.0442	306.8732
Worker	0.0251	0.0175	0.2413	6.6000e-004	0.0766	4.5000e-004	0.0771	0.0203	4.1000e-004	0.0207		66.7605	66.7605	1.7100e-003	1.6900e-003	67.3077
Total	**0.0781**	**3.1200**	**0.8002**	**0.0112**	**0.3623**	**0.0208**	**0.3831**	**0.0996**	**0.0199**	**0.1195**		**1,205.5387**	**1,205.5387**	**0.0319**	**0.1797**	**1,259.8968**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.38 Abandon Existing NCP: Outside Henry Cowell - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1267	0.8615	0.7223	1.5900e-003		0.0330	0.0330		0.0324	0.0324		130.2700	130.2700	0.0220		130.8208
Total	**0.1267**	**0.8615**	**0.7223**	**1.5900e-003**		**0.0330**	**0.0330**		**0.0324**	**0.0324**		**130.2700**	**130.2700**	**0.0220**		**130.8208**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0335	2.2101	0.3749	7.5800e-003	0.2002	0.0153	0.2155	0.0548	0.0146	0.0694		826.3428	826.3428	0.0245	0.1309	865.9696
Vendor	0.0175	0.7553	0.1810	2.6800e-003	0.0855	4.2500e-003	0.0897	0.0246	4.0600e-003	0.0286		288.1147	288.1147	5.5900e-003	0.0433	301.1596
Worker	0.0235	0.0156	0.2230	6.4000e-004	0.0766	4.3000e-004	0.0771	0.0203	3.9000e-004	0.0207		64.6209	64.6209	1.5400e-003	1.5700e-003	65.1269
Total	**0.0745**	**2.9810**	**0.7789**	**0.0109**	**0.3623**	**0.0199**	**0.3822**	**0.0997**	**0.0191**	**0.1187**		**1,179.0784**	**1,179.0784**	**0.0317**	**0.1758**	**1,232.2561**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.38 Abandon Existing NCP: Outside Henry Cowell - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1267	0.8615	0.7223	1.5900e-003		0.0330	0.0330		0.0324	0.0324	0.0000	130.2700	130.2700	0.0220		130.8208
Total	**0.1267**	**0.8615**	**0.7223**	**1.5900e-003**		**0.0330**	**0.0330**		**0.0324**	**0.0324**	**0.0000**	**130.2700**	**130.2700**	**0.0220**		**130.8208**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0335	2.2101	0.3749	7.5800e-003	0.2002	0.0153	0.2155	0.0548	0.0146	0.0694		826.3428	826.3428	0.0245	0.1309	865.9696
Vendor	0.0175	0.7553	0.1810	2.6800e-003	0.0855	4.2500e-003	0.0897	0.0246	4.0600e-003	0.0286		288.1147	288.1147	5.5900e-003	0.0433	301.1596
Worker	0.0235	0.0156	0.2230	6.4000e-004	0.0766	4.3000e-004	0.0771	0.0203	3.9000e-004	0.0207		64.6209	64.6209	1.5400e-003	1.5700e-003	65.1269
Total	**0.0745**	**2.9810**	**0.7789**	**0.0109**	**0.3623**	**0.0199**	**0.3822**	**0.0997**	**0.0191**	**0.1187**		**1,179.0784**	**1,179.0784**	**0.0317**	**0.1758**	**1,232.2561**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.39 Abandon Existing NCP: Inside Henry Cowell - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1267	0.8615	0.7223	1.5900e-003		0.0330	0.0330		0.0324	0.0324		130.2700	130.2700	0.0220		130.8208
Total	**0.1267**	**0.8615**	**0.7223**	**1.5900e-003**		**0.0330**	**0.0330**		**0.0324**	**0.0324**		**130.2700**	**130.2700**	**0.0220**		**130.8208**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0335	2.2119	0.3752	7.5900e-003	0.2004	0.0153	0.2157	0.0548	0.0146	0.0694		827.0252	827.0252	0.0246	0.1310	866.6847
Vendor	0.0175	0.7553	0.1810	2.6800e-003	0.0855	4.2500e-003	0.0897	0.0246	4.0600e-003	0.0286		288.1147	288.1147	5.5900e-003	0.0433	301.1596
Worker	0.0235	0.0156	0.2230	6.4000e-004	0.0766	4.3000e-004	0.0771	0.0203	3.9000e-004	0.0207		64.6209	64.6209	1.5400e-003	1.5700e-003	65.1269
Total	**0.0746**	**2.9828**	**0.7792**	**0.0109**	**0.3625**	**0.0200**	**0.3824**	**0.0997**	**0.0191**	**0.1188**		**1,179.7608**	**1,179.7608**	**0.0317**	**0.1759**	**1,232.9712**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.39 Abandon Existing NCP: Inside Henry Cowell - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1267	0.8615	0.7223	1.5900e-003		0.0330	0.0330		0.0324	0.0324	0.0000	130.2700	130.2700	0.0220		130.8208
Total	**0.1267**	**0.8615**	**0.7223**	**1.5900e-003**		**0.0330**	**0.0330**		**0.0324**	**0.0324**	**0.0000**	**130.2700**	**130.2700**	**0.0220**		**130.8208**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0335	2.2119	0.3752	7.5900e-003	0.2004	0.0153	0.2157	0.0548	0.0146	0.0694		827.0252	827.0252	0.0246	0.1310	866.6847
Vendor	0.0175	0.7553	0.1810	2.6800e-003	0.0855	4.2500e-003	0.0897	0.0246	4.0600e-003	0.0286		288.1147	288.1147	5.5900e-003	0.0433	301.1596
Worker	0.0235	0.0156	0.2230	6.4000e-004	0.0766	4.3000e-004	0.0771	0.0203	3.9000e-004	0.0207		64.6209	64.6209	1.5400e-003	1.5700e-003	65.1269
Total	**0.0746**	**2.9828**	**0.7792**	**0.0109**	**0.3625**	**0.0200**	**0.3824**	**0.0997**	**0.0191**	**0.1188**		**1,179.7608**	**1,179.7608**	**0.0317**	**0.1759**	**1,232.9712**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.552058	0.056962	0.193821	0.123008	0.021404	0.005318	0.010231	0.003525	0.000574	0.000778	0.028458	0.000952	0.002912

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1652	1.0000e-005	1.0900e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.3400e-003	2.3400e-003	1.0000e-005		2.4900e-003
Unmitigated	0.1652	1.0000e-005	1.0900e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.3400e-003	2.3400e-003	1.0000e-005		2.4900e-003

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1651					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-004	1.0000e-005	1.0900e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.3400e-003	2.3400e-003	1.0000e-005		2.4900e-003
Total	**0.1652**	**1.0000e-005**	**1.0900e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.3400e-003**	**2.3400e-003**	**1.0000e-005**		**2.4900e-003**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1651					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-004	1.0000e-005	1.0900e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.3400e-003	2.3400e-003	1.0000e-005		2.4900e-003
Total	**0.1652**	**1.0000e-005**	**1.0900e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.3400e-003**	**2.3400e-003**	**1.0000e-005**		**2.4900e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Newell Creek Pipeline Construction - Near Term

Santa Cruz County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	10.70	Acre	10.70	466,092.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	1.8	**Precipitation Freq (Days)**	61
Climate Zone	5			**Operational Year**	2032
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Area to be paved conservatively based on total length (linear feet) of pipelines by 20 feet width (near term construction)

Construction Phase - Schedule based on SCWD input

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

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Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Trips and VMT - Based on input from SCWD

Grading - Based on input from SCWD

Architectural Coating - Default

Vehicle Trips - Modeling construction only

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

On-road Fugitive Dust - Default

Area Coating - Modeling construction only

Construction Off-road Equipment Mitigation - Water exposed areas 2x per day

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	300.00	15.00
tblConstructionPhase	NumDays	300.00	10.00
tblConstructionPhase	NumDays	300.00	15.00
tblConstructionPhase	NumDays	300.00	15.00
tblConstructionPhase	NumDays	300.00	5.00
tblConstructionPhase	NumDays	30.00	5.00
tblConstructionPhase	NumDays	30.00	15.00
tblConstructionPhase	NumDays	30.00	132.00
tblConstructionPhase	NumDays	30.00	60.00
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tblConstructionPhase	NumDays	20.00	1.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	10.00	25.00
tblConstructionPhase	NumDays	10.00	20.00
tblConstructionPhase	NumDays	10.00	25.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstructionPhase	NumDays	10.00	34.00
tblConstructionPhase	NumDays	30.00	5.00
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tblConstructionPhase	NumDays	30.00	59.00
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tblGrading	AcresOfGrading	0.00	0.34
tblGrading	AcresOfGrading	0.00	8.90
tblGrading	AcresOfGrading	0.00	1.37
tblGrading	MaterialExported	0.00	3,038.00
tblGrading	MaterialExported	0.00	9,113.00
tblGrading	MaterialExported	0.00	26,730.00
tblGrading	MaterialExported	0.00	24,300.00
tblGrading	MaterialExported	0.00	849.00
tblGrading	MaterialExported	0.00	849.00
tblGrading	MaterialExported	0.00	233.00
tblOffRoadEquipment	HorsePower	130.00	75.00
tblOffRoadEquipment	HorsePower	130.00	75.00
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tblOffRoadEquipment	HorsePower	130.00	75.00
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tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	65.00	80.00
tblOffRoadEquipment	HorsePower	65.00	80.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	HorsePower	65.00	80.00
tblOffRoadEquipment	HorsePower	65.00	80.00
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tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	97.00	170.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
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Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	PhaseName		Big Trees RR Crossing: Backfill
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Tie in to FBPS
tblOffRoadEquipment	PhaseName		Big Trees RR Crossing: Boring and casing
tblOffRoadEquipment	PhaseName		Zayante Creek Crossing: CIDH Piles
tblOffRoadEquipment	PhaseName		Big Trees RR Crossing: Grout
tblOffRoadEquipment	PhaseName		Zayante Creek Crossing: CIDH Piles
tblOffRoadEquipment	PhaseName		Zayante Creek Crossing: Pipe support
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Outside Henry Cowell
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Inside Henry Cowell
tblOffRoadEquipment	PhaseName		Zayante Creek Crossing: Pipe support
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	PhaseName		Big Trees RR Crossing: Shaft excavation
tblOffRoadEquipment	PhaseName		Zayante Creek Crossing: Pier scour protect
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Paving
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Paving
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Outside Henry Cowell
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Inside Henry Cowell
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Paving
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Pressure test

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	PhaseName		GH Rd South: Test pipeline
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Paving
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Pavement striping
tblOffRoadEquipment	PhaseName		GH Rd South: Cathodic protection
tblOffRoadEquipment	PhaseName		Big Trees RR Crossing: Pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Paving
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Paving
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Paving
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: GHWTP tie in
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Outside Henry Cowell
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Inside Henry Cowell

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	3.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	3.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	3.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	3.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	50.00
tblTripsAndVMT	HaulingTripNumber	0.00	80.00
tblTripsAndVMT	HaulingTripNumber	0.00	40.00
tblTripsAndVMT	HaulingTripNumber	29.00	33.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	HaulingTripNumber	0.00	18.00
tblTripsAndVMT	HaulingTripNumber	0.00	63.00
tblTripsAndVMT	HaulingTripNumber	0.00	30.00
tblTripsAndVMT	HaulingTripNumber	0.00	50.00
tblTripsAndVMT	HaulingTripNumber	380.00	0.00
tblTripsAndVMT	HaulingTripNumber	0.00	812.00
tblTripsAndVMT	HaulingTripNumber	1,139.00	2,437.00
tblTripsAndVMT	HaulingTripNumber	3,341.00	7,148.00
tblTripsAndVMT	HaulingTripNumber	0.00	45.00
tblTripsAndVMT	HaulingTripNumber	0.00	67.00
tblTripsAndVMT	HaulingTripNumber	0.00	449.00
tblTripsAndVMT	HaulingTripNumber	106.00	133.00
tblTripsAndVMT	HaulingTripNumber	3,038.00	6,498.00
tblTripsAndVMT	HaulingTripNumber	0.00	449.00
tblTripsAndVMT	HaulingTripNumber	0.00	173.00
tblTripsAndVMT	HaulingTripNumber	0.00	404.00
tblTripsAndVMT	HaulingTripNumber	106.00	133.00
tblTripsAndVMT	HaulingTripNumber	0.00	17.00
tblTripsAndVMT	HaulingTripNumber	0.00	23.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	HaulingTripNumber	0.00	260.00
tblTripsAndVMT	HaulingTripNumber	0.00	64.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	12.00
tblTripsAndVMT	VendorTripNumber	0.00	12.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	76.00	4.00
tblTripsAndVMT	VendorTripNumber	76.00	6.00
tblTripsAndVMT	VendorTripNumber	76.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	76.00	2.00
tblTripsAndVMT	VendorTripNumber	76.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	58.00
tblTripsAndVMT	VendorTripNumber	0.00	85.00
tblTripsAndVMT	VendorTripNumber	0.00	78.00
tblTripsAndVMT	VendorTripNumber	0.00	50.00
tblTripsAndVMT	VendorTripNumber	0.00	72.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	50.00
tblTripsAndVMT	VendorTripNumber	0.00	16.00
tblTripsAndVMT	VendorTripNumber	0.00	112.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	93.00

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	14.00
tblTripsAndVMT	VendorTripNumber	0.00	14.00
tblTripsAndVMT	VendorTripNumber	0.00	16.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	16.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	12.00
tblTripsAndVMT	WorkerTripNumber	8.00	16.00
tblTripsAndVMT	WorkerTripNumber	18.00	16.00
tblTripsAndVMT	WorkerTripNumber	10.00	20.00
tblTripsAndVMT	WorkerTripNumber	5.00	4.00
tblTripsAndVMT	WorkerTripNumber	3.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	2.00
tblTripsAndVMT	WorkerTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	196.00	8.00
tblTripsAndVMT	WorkerTripNumber	196.00	6.00
tblTripsAndVMT	WorkerTripNumber	196.00	8.00
tblTripsAndVMT	WorkerTripNumber	8.00	16.00
tblTripsAndVMT	WorkerTripNumber	196.00	2.00
tblTripsAndVMT	WorkerTripNumber	196.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	6.00
tblTripsAndVMT	WorkerTripNumber	28.00	32.00
tblTripsAndVMT	WorkerTripNumber	28.00	36.00
tblTripsAndVMT	WorkerTripNumber	28.00	34.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	WorkerTripNumber	18.00	22.00
tblTripsAndVMT	WorkerTripNumber	18.00	22.00
tblTripsAndVMT	WorkerTripNumber	3.00	4.00
tblTripsAndVMT	WorkerTripNumber	18.00	22.00
tblTripsAndVMT	WorkerTripNumber	30.00	16.00
tblTripsAndVMT	WorkerTripNumber	28.00	34.00
tblTripsAndVMT	WorkerTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	4.00
tblTripsAndVMT	WorkerTripNumber	18.00	22.00
tblTripsAndVMT	WorkerTripNumber	3.00	2.00
tblTripsAndVMT	WorkerTripNumber	39.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	2.00
tblTripsAndVMT	WorkerTripNumber	8.00	6.00
tblTripsAndVMT	WorkerTripNumber	8.00	6.00
tblTripsAndVMT	WorkerTripNumber	30.00	16.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	45.00	16.00
tblTripsAndVMT	WorkerTripNumber	13.00	16.00
tblTripsAndVMT	WorkerTripNumber	5.00	6.00
tblTripsAndVMT	WorkerTripNumber	18.00	16.00

2.0 Emissions Summary

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	10.7585	96.6437	133.5395	0.2497	10.0861	4.6664	14.1589	2.5080	4.4944	6.4411	0.0000	24,067.9524	24,067.9524	4.5985	0.2888	24,234.7029
2023	1.7737	42.9746	21.1323	0.1406	4.1532	0.6856	4.6018	1.1324	0.6664	1.5578	0.0000	15,053.0526	15,053.0526	0.8295	2.0894	15,692.6010
2024	39.5705	49.0011	21.4221	0.1599	4.4605	0.6032	5.0637	1.2195	0.5677	1.7871	0.0000	17,077.1675	17,077.1675	0.9469	2.3163	17,791.1031
2025	0.2028	3.9839	1.5106	0.0125	0.3625	0.0530	0.4155	0.0997	0.0516	0.1513	0.0000	1,307.8635	1,307.8635	0.0537	0.1763	1,361.7394
Maximum	**39.5705**	**96.6437**	**133.5395**	**0.2497**	**10.0861**	**4.6664**	**14.1589**	**2.5080**	**4.4944**	**6.4411**	**0.0000**	**24,067.9524**	**24,067.9524**	**4.5985**	**2.3163**	**24,234.7029**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	10.7585	96.6437	133.5395	0.2497	10.0847	4.6664	14.1575	2.5078	4.4944	6.4409	0.0000	24,067.9524	24,067.9524	4.5985	0.2888	24,234.7029
2023	1.7737	42.9746	21.1323	0.1406	4.1188	0.6856	4.5675	1.1276	0.6664	1.5530	0.0000	15,053.0526	15,053.0526	0.8295	2.0894	15,692.6010
2024	39.5705	49.0011	21.4221	0.1599	4.4278	0.6032	5.0310	1.2151	0.5677	1.7827	0.0000	17,077.1675	17,077.1675	0.9469	2.3163	17,791.1031
2025	0.2028	3.9839	1.5106	0.0125	0.3625	0.0530	0.4155	0.0997	0.0516	0.1513	0.0000	1,307.8635	1,307.8635	0.0537	0.1763	1,361.7394
Maximum	**39.5705**	**96.6437**	**133.5395**	**0.2497**	**10.0847**	**4.6664**	**14.1575**	**2.5078**	**4.4944**	**6.4409**	**0.0000**	**24,067.9524**	**24,067.9524**	**4.5985**	**2.3163**	**24,234.7029**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.36**	**0.00**	**0.28**	**0.19**	**0.00**	**0.09**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1652	1.0000e-005	1.0900e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.3400e-003	2.3400e-003	1.0000e-005		2.4900e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1652**	**1.0000e-005**	**1.0900e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.3400e-003**	**2.3400e-003**	**1.0000e-005**	**0.0000**	**2.4900e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1652	1.0000e-005	1.0900e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.3400e-003	2.3400e-003	1.0000e-005		2.4900e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1652**	**1.0000e-005**	**1.0900e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.3400e-003**	**2.3400e-003**	**1.0000e-005**	**0.0000**	**2.4900e-003**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Brackney North: Mobilization (South HDD pit)	Site Preparation	8/22/2022	9/23/2022	5	25	
2	Brackney North: Mobilization (North HDD pit)	Site Preparation	8/22/2022	9/23/2022	5	25	
3	Brackney North: HDD (South entry)	Grading	9/21/2022	12/12/2022	5	59	
4	Brackney North: HDD (North entry)	Grading	9/21/2022	12/12/2022	5	59	
5	Brackney North: Carrier pipeline staging area prep	Site Preparation	10/28/2022	12/14/2022	5	34	
6	Brackney North: HDD (pullback)	Trenching	12/15/2022	12/16/2022	5	2	
7	Brackney North: Tie-in pipeline construction	Trenching	12/22/2022	1/26/2023	5	26	
8	NCP FBPS to Graham Hill WTP: Staging area	Grading	1/12/2023	4/6/2023	5	40	
9	Brackney North: Abandon existing pipeline	Trenching	1/27/2023	2/3/2023	5	6	
10	Brackney North: Restoration	Site Preparation	2/6/2023	3/3/2023	5	20	
11	Brackney North: Demobilization	Site Preparation	3/6/2023	3/17/2023	5	10	
12	Big Trees RR Crossing: Shaft excavation	Grading	4/7/2023	4/13/2023	5	5	
13	Big Trees RR Crossing: Boring and casing	Trenching	4/14/2023	4/27/2023	5	10	
14	Big Trees RR Crossing: Pipe install	Trenching	4/28/2023	5/4/2023	5	5	
15	Big Trees RR Crossing: Grout	Trenching	5/5/2023	5/11/2023	5	5	
16	Big Trees RR Crossing: Backfill	Trenching	5/12/2023	5/18/2023	5	5	
17	Zayante Creek Crossing: CIDH Piles	Building Construction	8/1/2023	8/14/2023	5	15	

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

18	Zayante Creek Crossing: Pier scour protect	Building Construction	8/15/2023	8/23/2023	5	10	
19	Zayante Creek Crossing: Pipe support	Building Construction	8/29/2023	9/19/2023	5	15	
20	Zayante Creek Crossing: Install pipe span	Building Construction	9/20/2023	10/10/2023	5	15	
21	Zayante Creek Crossing: Install flex connect	Building Construction	10/11/2023	10/17/2023	5	5	
22	Zayante Creek Crossing: Grade for drainage	Grading	10/18/2023	10/24/2023	5	5	
23	FBPS to Zayante: Road removal/pipe install	Grading	10/18/2023	11/7/2023	5	15	
24	Zayante to Big Trees RR: Road removal/pipe install	Grading	10/25/2023	12/7/2023	5	30	
25	GH Rd North: Road removal/pipe install	Grading	1/9/2024	5/23/2024	5	132	
26	FBPS to Zayante: Paving	Paving	4/16/2024	4/16/2024	5	1	
27	Zayante to Big Trees RR: Paving	Paving	4/17/2024	4/17/2024	5	1	
28	GH Rd North: Pressure test	Trenching	7/17/2024	7/23/2024	5	5	
29	GH Rd North: Paving	Paving	7/17/2024	7/30/2024	5	10	
30	GH Rd South: Road removal/pipe install	Grading	7/24/2024	10/16/2024	5	60	
31	GH Rd North: Tie in to FBPS	Trenching	7/24/2024	7/30/2024	5	5	
32	GH Rd South: Test pipeline	Trenching	10/17/2024	10/24/2024	5	5	
33	GH Rd South: Paving	Paving	10/17/2024	10/23/2024	5	5	
34	GH Rd South: GHWTP tie in	Trenching	10/24/2024	10/25/2024	5	2	
35	GH Rd South: Pavement striping	Architectural Coating	10/24/2024	10/30/2024	5	5	
36	GH Rd South: Cathodic protection	Trenching	10/27/2024	11/8/2024	5	10	
37	Abandon Existing NCP: Outside Henry Cowell	Trenching	12/11/2024	1/2/2025	5	15	
38	Abandon Existing NCP: Inside Henry Cowell	Trenching	1/3/2025	2/21/2025	5	35	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 10.7

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 27,966 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Brackney North: Mobilization (South HDD pit)	Excavators	1	8.00	158	0.38
Brackney North: Mobilization (South HDD pit)	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: Mobilization (South HDD pit)	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Brackney North: Mobilization (South HDD pit)	Dumpers/Tenders	1	8.00	16	0.38
Brackney North: Mobilization (North HDD pit)	Excavators	1	8.00	158	0.38
Brackney North: Mobilization (North HDD pit)	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: Mobilization (North HDD pit)	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Brackney North: Mobilization (North HDD pit)	Dumpers/Tenders	1	8.00	16	0.38
Brackney North: HDD (South entry)	Pumps	3	10.00	84	0.74
Brackney North: HDD (South entry)	Excavators	1	10.00	158	0.38
Brackney North: HDD (South entry)	Tractors/Loaders/Backhoes	1	10.00	97	0.37
Brackney North: HDD (South entry)	Bore/Drill Rigs	1	10.00	221	0.50
Brackney North: HDD (South entry)	Other Material Handling Equipment	1	10.00	168	0.40
Brackney North: HDD (South entry)	Forklifts	1	10.00	89	0.20
Brackney North: HDD (South entry)	Generator Sets	3	10.00	84	0.74
Brackney North: HDD (South entry)	Other General Industrial Equipment	1	10.00	88	0.34
Brackney North: HDD (North entry)	Pumps	3	10.00	84	0.74
Brackney North: HDD (North entry)	Excavators	1	10.00	158	0.38
Brackney North: HDD (North entry)	Tractors/Loaders/Backhoes	1	10.00	97	0.37
Brackney North: HDD (North entry)	Bore/Drill Rigs	1	10.00	221	0.50
Brackney North: HDD (North entry)	Other Material Handling Equipment	1	10.00	168	0.40
Brackney North: HDD (North entry)	Forklifts	1	10.00	89	0.20
Brackney North: HDD (North entry)	Generator Sets	3	10.00	84	0.74

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Brackney North: HDD (North entry)	Other General Industrial Equipment	1	10.00	88	0.34
Brackney North: Carrier pipeline staging area prep	Excavators	2	8.00	158	0.38
Brackney North: Carrier pipeline staging area prep	Welders	1	8.00	46	0.45
Brackney North: Carrier pipeline staging area prep	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: Carrier pipeline staging area prep	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Brackney North: HDD (pullback)	Excavators	5	24.00	158	0.38
Brackney North: HDD (pullback)	Bore/Drill Rigs	1	24.00	221	0.50
Brackney North: HDD (pullback)	Other Material Handling Equipment	1	24.00	168	0.40
Brackney North: HDD (pullback)	Pumps	3	24.00	84	0.74
Brackney North: HDD (pullback)	Generator Sets	6	10.00	84	0.74
Brackney North: HDD (pullback)	Other General Industrial Equipment	2	10.00	88	0.34
Brackney North: Tie-in pipeline construction	Pavers	1	8.00	130	0.42
Brackney North: Tie-in pipeline construction	Paving Equipment	1	8.00	132	0.36
Brackney North: Tie-in pipeline construction	Rollers	1	8.00	80	0.38
Brackney North: Tie-in pipeline construction	Welders	1	8.00	46	0.45
Brackney North: Tie-in pipeline construction	Excavators	1	8.00	158	0.38
Brackney North: Abandon existing pipeline	Generator Sets	1	8.00	84	0.74
Brackney North: Abandon existing pipeline	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Brackney North: Abandon existing pipeline	Excavators	1	8.00	158	0.38
Brackney North: Abandon existing pipeline	Cement and Mortar Mixers	2	8.00	9	0.56
Brackney North: Abandon existing pipeline	Pumps	2	8.00	84	0.74
Brackney North: Restoration	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: Restoration	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Brackney North: Restoration	Air Compressors	1	8.00	78	0.48
Brackney North: Restoration	Excavators	2	8.00	158	0.38
Brackney North: Restoration	Rollers	2	8.00	80	0.38

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Brackney North: Demobilization	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: Demobilization	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Brackney North: Demobilization	Excavators	2	8.00	158	0.38
NCP FBPS to Graham Hill WTP: Staging area	Excavators	0	8.00	158	0.38
NCP FBPS to Graham Hill WTP: Staging area	Graders	0	8.00	187	0.41
NCP FBPS to Graham Hill WTP: Staging area	Rubber Tired Dozers	0	8.00	247	0.40
NCP FBPS to Graham Hill WTP: Staging area	Scrapers	0	8.00	367	0.48
NCP FBPS to Graham Hill WTP: Staging area	Tractors/Loaders/Backhoes	1	8.00	97	0.37
NCP FBPS to Graham Hill WTP: Staging area	Dumpers/Tenders	1	4.00	16	0.38
Big Trees RR Crossing: Shaft excavation	Dumpers/Tenders	1	8.00	16	0.38
Big Trees RR Crossing: Shaft excavation	Excavators	1	8.00	158	0.38
Big Trees RR Crossing: Boring and casing	Bore/Drill Rigs	1	8.00	221	0.50
Big Trees RR Crossing: Pipe install	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Big Trees RR Crossing: Grout	Cement and Mortar Mixers	1	8.00	9	0.56
Big Trees RR Crossing: Backfill	Aerial Lifts	0	1.00	63	0.31
Zayante Creek Crossing: CIDH Piles	Cranes	0	7.00	231	0.29
Zayante Creek Crossing: CIDH Piles	Forklifts	0	8.00	89	0.20
Zayante Creek Crossing: CIDH Piles	Generator Sets	0	8.00	84	0.74
Zayante Creek Crossing: CIDH Piles	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Zayante Creek Crossing: CIDH Piles	Welders	0	8.00	46	0.45
Zayante Creek Crossing: CIDH Piles	Cement and Mortar Mixers	1	8.00	9	0.56
Zayante Creek Crossing: CIDH Piles	Bore/Drill Rigs	1	8.00	221	0.50
Zayante Creek Crossing: Pier scour protect	Cranes	0	7.00	231	0.29
Zayante Creek Crossing: Pier scour protect	Forklifts	0	8.00	89	0.20
Zayante Creek Crossing: Pier scour protect	Generator Sets	0	8.00	84	0.74
Zayante Creek Crossing: Pier scour protect	Tractors/Loaders/Backhoes	0	7.00	97	0.37

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Zayante Creek Crossing: Pier scour protect	Welders	0	8.00	46	0.45
Zayante Creek Crossing: Pier scour protect	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Zayante Creek Crossing: Pier scour protect	Dumpers/Tenders	1	3.00	16	0.38
Zayante Creek Crossing: Pipe support	Cranes	0	7.00	231	0.29
Zayante Creek Crossing: Pipe support	Forklifts	0	8.00	89	0.20
Zayante Creek Crossing: Pipe support	Generator Sets	0	8.00	84	0.74
Zayante Creek Crossing: Pipe support	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Zayante Creek Crossing: Pipe support	Welders	0	8.00	46	0.45
Zayante Creek Crossing: Pipe support	Cement and Mortar Mixers	1	8.00	9	0.56
Zayante Creek Crossing: Pipe support	Concrete/Industrial Saws	1	1.00	81	0.73
Zayante Creek Crossing: Install pipe span	Cranes	1	8.00	231	0.29
Zayante Creek Crossing: Install pipe span	Forklifts	0	8.00	89	0.20
Zayante Creek Crossing: Install pipe span	Generator Sets	0	8.00	84	0.74
Zayante Creek Crossing: Install pipe span	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Zayante Creek Crossing: Install pipe span	Welders	0	8.00	46	0.45
Zayante Creek Crossing: Install flex connect	Cranes	0	7.00	231	0.29
Zayante Creek Crossing: Install flex connect	Forklifts	0	8.00	89	0.20
Zayante Creek Crossing: Install flex connect	Generator Sets	0	8.00	84	0.74
Zayante Creek Crossing: Install flex connect	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Zayante Creek Crossing: Install flex connect	Welders	0	8.00	46	0.45
Zayante Creek Crossing: Grade for drainage	Excavators	0	8.00	158	0.38
Zayante Creek Crossing: Grade for drainage	Graders	0	8.00	187	0.41
Zayante Creek Crossing: Grade for drainage	Rubber Tired Dozers	0	8.00	247	0.40
Zayante Creek Crossing: Grade for drainage	Scrapers	0	8.00	367	0.48
Zayante Creek Crossing: Grade for drainage	Tractors/Loaders/Backhoes	1	8.00	97	0.37

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

FBPS to Zayante: Road removal/pipe install	Air Compressors	0	1.00	78	0.48
FBPS to Zayante: Road removal/pipe install	Excavators	1	1.00	158	0.38
FBPS to Zayante: Road removal/pipe install	Tractors/Loaders/Backhoes	1	1.00	97	0.37
FBPS to Zayante: Road removal/pipe install	Graders	0	8.00	187	0.41
FBPS to Zayante: Road removal/pipe install	Concrete/Industrial Saws	1	1.00	81	0.73
FBPS to Zayante: Road removal/pipe install	Dumpers/Tenders	1	1.00	16	0.38
FBPS to Zayante: Road removal/pipe install	Skid Steer Loaders	1	1.00	65	0.37
FBPS to Zayante: Road removal/pipe install	Excavators	1	3.00	158	0.38
FBPS to Zayante: Road removal/pipe install	Cement and Mortar Mixers	1	2.00	9	0.56
FBPS to Zayante: Road removal/pipe install	Tractors/Loaders/Backhoes	1	2.00	170	0.37
FBPS to Zayante: Road removal/pipe install	Rollers	1	0.50	80	0.38
FBPS to Zayante: Road removal/pipe install	Plate Compactors	1	0.50	8	0.43
FBPS to Zayante: Road removal/pipe install	Dumpers/Tenders	1	0.50	16	0.38
FBPS to Zayante: Paving	Pavers	1	5.00	75	0.42
FBPS to Zayante: Paving	Paving Equipment	0	8.00	132	0.36
FBPS to Zayante: Paving	Rollers	1	5.00	170	0.38
FBPS to Zayante: Paving	Tractors/Loaders/Backhoes	1	5.00	97	0.37
FBPS to Zayante: Paving	Tractors/Loaders/Backhoes	1	5.00	170	0.37
FBPS to Zayante: Paving	Skid Steer Loaders	1	5.00	80	0.37
FBPS to Zayante: Paving	Plate Compactors	1	5.00	8	0.43
FBPS to Zayante: Paving	Dumpers/Tenders	1	5.00	16	0.38
Zayante to Big Trees RR: Road removal/pipe install	Air Compressors	0	1.00	78	0.48
Zayante to Big Trees RR: Road removal/pipe install	Excavators	1	1.00	158	0.38
Zayante to Big Trees RR: Road removal/pipe install	Tractors/Loaders/Backhoes	1	1.00	97	0.37
Zayante to Big Trees RR: Road removal/pipe install	Graders	0	8.00	187	0.41

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Zayante to Big Trees RR: Road removal/pipe install	Concrete/Industrial Saws	1	1.00	81	0.73
Zayante to Big Trees RR: Road removal/pipe install	Dumpers/Tenders	1	1.00	16	0.38
Zayante to Big Trees RR: Road removal/pipe install	Skid Steer Loaders	1	1.00	65	0.37
Zayante to Big Trees RR: Road removal/pipe install	Excavators	1	3.00	158	0.38
Zayante to Big Trees RR: Road removal/pipe install	Cement and Mortar Mixers	1	2.00	9	0.56
Zayante to Big Trees RR: Road removal/pipe install	Tractors/Loaders/Backhoes	1	2.00	170	0.37
Zayante to Big Trees RR: Road removal/pipe install	Rollers	1	0.50	80	0.38
Zayante to Big Trees RR: Road removal/pipe install	Plate Compactors	1	0.50	8	0.43
Zayante to Big Trees RR: Road removal/pipe install	Dumpers/Tenders	1	0.50	16	0.38
Zayante to Big Trees RR: Paving	Pavers	1	5.00	75	0.42
Zayante to Big Trees RR: Paving	Paving Equipment	0	8.00	132	0.36
Zayante to Big Trees RR: Paving	Rollers	1	5.00	170	0.38
Zayante to Big Trees RR: Paving	Tractors/Loaders/Backhoes	1	5.00	97	0.37
Zayante to Big Trees RR: Paving	Tractors/Loaders/Backhoes	1	5.00	170	0.37
Zayante to Big Trees RR: Paving	Skid Steer Loaders	1	5.00	80	0.37
Zayante to Big Trees RR: Paving	Plate Compactors	1	5.00	8	0.43
Zayante to Big Trees RR: Paving	Dumpers/Tenders	1	5.00	16	0.38
GH Rd North: Road removal/pipe install	Air Compressors	0	1.00	78	0.48
GH Rd North: Road removal/pipe install	Excavators	1	1.00	158	0.38
GH Rd North: Road removal/pipe install	Tractors/Loaders/Backhoes	1	1.00	97	0.37
GH Rd North: Road removal/pipe install	Graders	0	8.00	187	0.41
GH Rd North: Road removal/pipe install	Concrete/Industrial Saws	1	1.00	81	0.73
GH Rd North: Road removal/pipe install	Dumpers/Tenders	1	1.00	16	0.38
GH Rd North: Road removal/pipe install	Skid Steer Loaders	1	1.00	65	0.37
GH Rd North: Road removal/pipe install	Excavators	1	3.00	158	0.38
GH Rd North: Road removal/pipe install	Cement and Mortar Mixers	1	2.00	9	0.56
GH Rd North: Road removal/pipe install	Tractors/Loaders/Backhoes	1	2.00	170	0.37

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

GH Rd North: Road removal/pipe install	Rollers	1	0.50	80	0.38
GH Rd North: Road removal/pipe install	Plate Compactors	1	0.50	8	0.43
GH Rd North: Road removal/pipe install	Dumpers/Tenders	1	0.50	16	0.38
GH Rd North: Paving	Pavers	1	5.00	75	0.42
GH Rd North: Paving	Paving Equipment	0	8.00	132	0.36
GH Rd North: Paving	Rollers	1	5.00	170	0.38
GH Rd North: Paving	Tractors/Loaders/Backhoes	1	5.00	97	0.37
GH Rd North: Paving	Tractors/Loaders/Backhoes	1	5.00	170	0.37
GH Rd North: Paving	Skid Steer Loaders	1	5.00	80	0.37
GH Rd North: Paving	Plate Compactors	1	5.00	8	0.43
GH Rd North: Paving	Dumpers/Tenders	1	5.00	16	0.38
GH Rd North: Pressure test	Pumps	1	8.00	84	0.74
GH Rd North: Tie in to FBPS	Air Compressors	0	1.00	78	0.48
GH Rd South: Road removal/pipe install	Air Compressors	0	1.00	78	0.48
GH Rd South: Road removal/pipe install	Excavators	1	1.00	158	0.38
GH Rd South: Road removal/pipe install	Tractors/Loaders/Backhoes	1	1.00	97	0.37
GH Rd South: Road removal/pipe install	Graders	0	8.00	187	0.41
GH Rd South: Road removal/pipe install	Concrete/Industrial Saws	1	1.00	81	0.73
GH Rd South: Road removal/pipe install	Dumpers/Tenders	1	1.00	16	0.38
GH Rd South: Road removal/pipe install	Skid Steer Loaders	1	1.00	65	0.37
GH Rd South: Road removal/pipe install	Excavators	1	3.00	158	0.38
GH Rd South: Road removal/pipe install	Cement and Mortar Mixers	1	2.00	9	0.56
GH Rd South: Road removal/pipe install	Tractors/Loaders/Backhoes	1	2.00	170	0.37
GH Rd South: Road removal/pipe install	Rollers	1	0.50	80	0.38
GH Rd South: Road removal/pipe install	Plate Compactors	1	0.50	8	0.43
GH Rd South: Road removal/pipe install	Dumpers/Tenders	1	0.50	16	0.38
GH Rd South: Paving	Pavers	1	5.00	75	0.42
GH Rd South: Paving	Paving Equipment	0	8.00	132	0.36
GH Rd South: Paving	Rollers	1	5.00	170	0.38

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

GH Rd South: Paving	Tractors/Loaders/Backhoes	1	5.00	97	0.37
GH Rd South: Paving	Tractors/Loaders/Backhoes	1	5.00	170	0.37
GH Rd South: Paving	Skid Steer Loaders	1	5.00	80	0.37
GH Rd South: Paving	Plate Compactors	1	5.00	8	0.43
GH Rd South: Paving	Dumpers/Tenders	1	5.00	16	0.38
GH Rd South: Pavement striping	Surfacing Equipment	1	8.00	263	0.30
GH Rd South: Test pipeline	Pumps	1	8.00	84	0.74
GH Rd South: GHWTP tie in	Tractors/Loaders/Backhoes	1	8.00	97	0.37
GH Rd South: Cathodic protection	Surfacing Equipment	1	8.00	263	0.30
Abandon Existing NCP: Outside Henry Cowell	Cement and Mortar Mixers	1	5.00	9	0.56
Abandon Existing NCP: Outside Henry Cowell	Dumpers/Tenders	1	8.00	16	0.38
Abandon Existing NCP: Outside Henry Cowell	Tractors/Loaders/Backhoes	1	1.00	97	0.37
Abandon Existing NCP: Inside Henry Cowell	Cement and Mortar Mixers	1	5.00	9	0.56
Abandon Existing NCP: Inside Henry Cowell	Dumpers/Tenders	1	8.00	16	0.38
Abandon Existing NCP: Inside Henry Cowell	Tractors/Loaders/Backhoes	1	1.00	97	0.37
Brackney North: HDD (South entry)	Graders	0	1.00	187	0.41
Brackney North: HDD (North entry)	Graders	0	1.00	187	0.41
GH Rd South: Pavement striping	Air Compressors	0	6.00	78	0.48
FBPS to Zayante: Road removal/pipe install	Rubber Tired Dozers	0	8.00	247	0.40
Zayante to Big Trees RR: Road removal/pipe install	Rubber Tired Dozers	0	8.00	247	0.40
GH Rd North: Road removal/pipe install	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: HDD (South entry)	Rubber Tired Dozers	0	8.00	247	0.40
GH Rd South: Road removal/pipe install	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: HDD (North entry)	Rubber Tired Dozers	0	8.00	247	0.40
FBPS to Zayante: Road removal/pipe install	Scrapers	0	8.00	367	0.48
Zayante to Big Trees RR: Road removal/pipe install	Scrapers	0	8.00	367	0.48
GH Rd North: Road removal/pipe install	Scrapers	0	8.00	367	0.48

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Brackney North: HDD (South entry)	Scrapers	0	8.00	367	0.48
GH Rd South: Road removal/pipe install	Scrapers	0	8.00	367	0.48
Brackney North: HDD (North entry)	Scrapers	0	8.00	367	0.48
Big Trees RR Crossing: Shaft excavation	Graders	0	8.00	187	0.41
Big Trees RR Crossing: Shaft excavation	Rubber Tired Dozers	0	8.00	247	0.40
Big Trees RR Crossing: Shaft excavation	Scrapers	0	8.00	367	0.48
Big Trees RR Crossing: Shaft excavation	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Brackney North: Mobilization (South H	3	16.00	8.00	50.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Mobilization (North HD	3	16.00	8.00	50.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: HDD (South entry)	12	16.00	16.00	133.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: HDD (North entry)	12	16.00	16.00	133.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Carrier pipeline stagin	3	10.00	8.00	17.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: HDD (pullback)	18	16.00	8.00	23.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Tie-in pipeline construction	5	16.00	16.00	260.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Abandon existing pipel	7	16.00	12.00	64.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Restoration	7	16.00	12.00	80.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Demobilization	4	20.00	12.00	40.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
NCP FBPS to Graham Hill WTP: Staging are	2	6.00	6.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Big Trees RR Crossing: Shaft excav	2	4.00	8.00	33.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Big Trees RR Crossing: Boring and	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Big Trees RR Crossing: Pipe install	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Big Trees RR Crossing: Grout	1	2.00	2.00	10.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Big Trees RR Crossing: Backfill	0	2.00	4.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: CIDH Piles	2	8.00	4.00	18.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Zayante Creek Crossing: Pier scour p	2	6.00	6.00	63.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: Pipe suppor	2	8.00	2.00	30.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: Install pipe s	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: Install flex c	1	2.00	4.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: Grade for dr	1	6.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
FBPS to Zayante: Road removal/pipe ins	11	32.00	58.00	812.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
FBPS to Zayante: Paving	7	22.00	50.00	45.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante to Big Trees RR: Road removal/pip	11	36.00	85.00	2,437.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante to Big Trees RR: Paving	7	22.00	72.00	67.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd North: Road removal/pipe install	11	34.00	78.00	7,148.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd North: Paving	7	22.00	50.00	449.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd North: Pressure test	1	4.00	4.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd North: Tie in to FBPS	0	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: Road removal/pipe install	11	34.00	112.00	6,498.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: Paving	7	22.00	93.00	449.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: Pavement striping	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: Test pipeline	1	4.00	4.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: GHWTP tie in	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: Cathodic protection	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Abandon Existing NCP: Outside Henry C	3	6.00	14.00	173.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Abandon Existing NCP: Inside Henry Co	3	6.00	14.00	404.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Brackney North: Mobilization (South HDD pit) - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4406	3.9172	5.7439	9.0300e-003		0.1934	0.1934		0.1793	0.1793		862.1945	862.1945	0.2657		868.8366
Total	**0.4406**	**3.9172**	**5.7439**	**9.0300e-003**	**0.0000**	**0.1934**	**0.1934**	**0.0000**	**0.1793**	**0.1793**		**862.1945**	**862.1945**	**0.2657**		**868.8366**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.5700e-003	0.5069	0.0722	1.4200e-003	0.3256	3.8200e-003	0.3294	0.0809	3.6600e-003	0.0845		154.8001	154.8001	4.3500e-003	0.0245	162.2153
Vendor	0.0183	0.5647	0.1319	1.6400e-003	0.4328	5.2000e-003	0.4380	0.1083	4.9700e-003	0.1133		176.4991	176.4991	3.5400e-003	0.0266	184.5194
Worker	0.0854	0.0744	0.7536	1.7900e-003	2.1590	1.3500e-003	2.1603	0.5340	1.2500e-003	0.5352		181.2955	181.2955	6.1300e-003	6.1900e-003	183.2920
Total	**0.1132**	**1.1460**	**0.9577**	**4.8500e-003**	**2.9173**	**0.0104**	**2.9277**	**0.7231**	**9.8800e-003**	**0.7330**		**512.5946**	**512.5946**	**0.0140**	**0.0573**	**530.0268**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Brackney North: Mobilization (South HDD pit) - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4406	3.9172	5.7439	9.0300e-003		0.1934	0.1934		0.1793	0.1793	0.0000	862.1945	862.1945	0.2657		868.8366
Total	**0.4406**	**3.9172**	**5.7439**	**9.0300e-003**	**0.0000**	**0.1934**	**0.1934**	**0.0000**	**0.1793**	**0.1793**	**0.0000**	**862.1945**	**862.1945**	**0.2657**		**868.8366**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.5700e-003	0.5069	0.0722	1.4200e-003	0.3256	3.8200e-003	0.3294	0.0809	3.6600e-003	0.0845		154.8001	154.8001	4.3500e-003	0.0245	162.2153
Vendor	0.0183	0.5647	0.1319	1.6400e-003	0.4328	5.2000e-003	0.4380	0.1083	4.9700e-003	0.1133		176.4991	176.4991	3.5400e-003	0.0266	184.5194
Worker	0.0854	0.0744	0.7536	1.7900e-003	2.1590	1.3500e-003	2.1603	0.5340	1.2500e-003	0.5352		181.2955	181.2955	6.1300e-003	6.1900e-003	183.2920
Total	**0.1132**	**1.1460**	**0.9577**	**4.8500e-003**	**2.9173**	**0.0104**	**2.9277**	**0.7231**	**9.8800e-003**	**0.7330**		**512.5946**	**512.5946**	**0.0140**	**0.0573**	**530.0268**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Brackney North: Mobilization (North HDD pit) - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4406	3.9172	5.7439	9.0300e-003		0.1934	0.1934		0.1793	0.1793		862.1945	862.1945	0.2657		868.8366
Total	**0.4406**	**3.9172**	**5.7439**	**9.0300e-003**	**0.0000**	**0.1934**	**0.1934**	**0.0000**	**0.1793**	**0.1793**		**862.1945**	**862.1945**	**0.2657**		**868.8366**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.5700e-003	0.5069	0.0722	1.4200e-003	0.3520	3.8200e-003	0.3558	0.0874	3.6600e-003	0.0910		154.8001	154.8001	4.3500e-003	0.0245	162.2153
Vendor	0.0183	0.5647	0.1319	1.6400e-003	0.4677	5.2000e-003	0.4729	0.1169	4.9700e-003	0.1218		176.4991	176.4991	3.5400e-003	0.0266	184.5194
Worker	0.0854	0.0744	0.7536	1.7900e-003	2.3367	1.3500e-003	2.3380	0.5776	1.2500e-003	0.5788		181.2955	181.2955	6.1300e-003	6.1900e-003	183.2920
Total	**0.1132**	**1.1460**	**0.9577**	**4.8500e-003**	**3.1564**	**0.0104**	**3.1667**	**0.7818**	**9.8800e-003**	**0.7917**		**512.5946**	**512.5946**	**0.0140**	**0.0573**	**530.0268**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Brackney North: Mobilization (North HDD pit) - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4406	3.9172	5.7439	9.0300e-003		0.1934	0.1934		0.1793	0.1793	0.0000	862.1945	862.1945	0.2657		868.8366
Total	**0.4406**	**3.9172**	**5.7439**	**9.0300e-003**	**0.0000**	**0.1934**	**0.1934**	**0.0000**	**0.1793**	**0.1793**	**0.0000**	**862.1945**	**862.1945**	**0.2657**		**868.8366**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.5700e-003	0.5069	0.0722	1.4200e-003	0.3520	3.8200e-003	0.3558	0.0874	3.6600e-003	0.0910		154.8001	154.8001	4.3500e-003	0.0245	162.2153
Vendor	0.0183	0.5647	0.1319	1.6400e-003	0.4677	5.2000e-003	0.4729	0.1169	4.9700e-003	0.1218		176.4991	176.4991	3.5400e-003	0.0266	184.5194
Worker	0.0854	0.0744	0.7536	1.7900e-003	2.3367	1.3500e-003	2.3380	0.5776	1.2500e-003	0.5788		181.2955	181.2955	6.1300e-003	6.1900e-003	183.2920
Total	**0.1132**	**1.1460**	**0.9577**	**4.8500e-003**	**3.1564**	**0.0104**	**3.1667**	**0.7818**	**9.8800e-003**	**0.7917**		**512.5946**	**512.5946**	**0.0140**	**0.0573**	**530.0268**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Brackney North: HDD (South entry) - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.2500e-003	0.0000	1.2500e-003	1.9000e-004	0.0000	1.9000e-004			0.0000			0.0000
Off-Road	3.9959	35.4978	45.7642	0.0838		1.8166	1.8166		1.7620	1.7620		8,010.9352	8,010.9352	1.3099		8,043.6817
Total	**3.9959**	**35.4978**	**45.7642**	**0.0838**	**1.2500e-003**	**1.8166**	**1.8178**	**1.9000e-004**	**1.7620**	**1.7622**		**8,010.9352**	**8,010.9352**	**1.3099**		**8,043.6817**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0108	0.5713	0.0813	1.6000e-003	0.3968	4.3100e-003	0.4011	0.0985	4.1200e-003	0.1026		174.4780	174.4780	4.9000e-003	0.0276	182.8359
Vendor	0.0366	1.1293	0.2639	3.2900e-003	0.9353	0.0104	0.9457	0.2337	9.9400e-003	0.2436		352.9982	352.9982	7.0800e-003	0.0532	369.0388
Worker	0.0854	0.0744	0.7536	1.7900e-003	2.3367	1.3500e-003	2.3380	0.5776	1.2500e-003	0.5788		181.2955	181.2955	6.1300e-003	6.1900e-003	183.2920
Total	**0.1327**	**1.7751**	**1.0989**	**6.6800e-003**	**3.6688**	**0.0161**	**3.6848**	**0.9098**	**0.0153**	**0.9251**		**708.7717**	**708.7717**	**0.0181**	**0.0871**	**735.1668**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Brackney North: HDD (South entry) - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.6000e-004	0.0000	5.6000e-004	9.0000e-005	0.0000	9.0000e-005			0.0000			0.0000
Off-Road	3.9959	35.4978	45.7642	0.0838		1.8166	1.8166		1.7620	1.7620	0.0000	8,010.9352	8,010.9352	1.3099		8,043.6817
Total	**3.9959**	**35.4978**	**45.7642**	**0.0838**	**5.6000e-004**	**1.8166**	**1.8171**	**9.0000e-005**	**1.7620**	**1.7621**	**0.0000**	**8,010.9352**	**8,010.9352**	**1.3099**		**8,043.6817**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0108	0.5713	0.0813	1.6000e-003	0.3968	4.3100e-003	0.4011	0.0985	4.1200e-003	0.1026		174.4780	174.4780	4.9000e-003	0.0276	182.8359
Vendor	0.0366	1.1293	0.2639	3.2900e-003	0.9353	0.0104	0.9457	0.2337	9.9400e-003	0.2436		352.9982	352.9982	7.0800e-003	0.0532	369.0388
Worker	0.0854	0.0744	0.7536	1.7900e-003	2.3367	1.3500e-003	2.3380	0.5776	1.2500e-003	0.5788		181.2955	181.2955	6.1300e-003	6.1900e-003	183.2920
Total	**0.1327**	**1.7751**	**1.0989**	**6.6800e-003**	**3.6688**	**0.0161**	**3.6848**	**0.9098**	**0.0153**	**0.9251**		**708.7717**	**708.7717**	**0.0181**	**0.0871**	**735.1668**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Brackney North: HDD (North entry) - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.2500e-003	0.0000	1.2500e-003	1.9000e-004	0.0000	1.9000e-004			0.0000			0.0000
Off-Road	3.9959	35.4978	45.7642	0.0838		1.8166	1.8166		1.7620	1.7620		8,010.9352	8,010.9352	1.3099		8,043.6817
Total	**3.9959**	**35.4978**	**45.7642**	**0.0838**	**1.2500e-003**	**1.8166**	**1.8178**	**1.9000e-004**	**1.7620**	**1.7622**		**8,010.9352**	**8,010.9352**	**1.3099**		**8,043.6817**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0108	0.5713	0.0813	1.6000e-003	0.0391	4.3100e-003	0.0434	0.0107	4.1200e-003	0.0148		174.4780	174.4780	4.9000e-003	0.0276	182.8359
Vendor	0.0366	1.1293	0.2639	3.2900e-003	0.0977	0.0104	0.1080	0.0281	9.9400e-003	0.0380		352.9982	352.9982	7.0800e-003	0.0532	369.0388
Worker	0.0854	0.0744	0.7536	1.7900e-003	0.2044	1.3500e-003	0.2057	0.0542	1.2500e-003	0.0554		181.2955	181.2955	6.1300e-003	6.1900e-003	183.2920
Total	**0.1327**	**1.7751**	**1.0989**	**6.6800e-003**	**0.3411**	**0.0161**	**0.3572**	**0.0930**	**0.0153**	**0.1083**		**708.7717**	**708.7717**	**0.0181**	**0.0871**	**735.1668**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Brackney North: HDD (North entry) - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.6000e-004	0.0000	5.6000e-004	9.0000e-005	0.0000	9.0000e-005			0.0000			0.0000
Off-Road	3.9959	35.4978	45.7642	0.0838		1.8166	1.8166		1.7620	1.7620	0.0000	8,010.9352	8,010.9352	1.3099		8,043.6817
Total	**3.9959**	**35.4978**	**45.7642**	**0.0838**	**5.6000e-004**	**1.8166**	**1.8171**	**9.0000e-005**	**1.7620**	**1.7621**	**0.0000**	**8,010.9352**	**8,010.9352**	**1.3099**		**8,043.6817**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0108	0.5713	0.0813	1.6000e-003	0.0391	4.3100e-003	0.0434	0.0107	4.1200e-003	0.0148		174.4780	174.4780	4.9000e-003	0.0276	182.8359
Vendor	0.0366	1.1293	0.2639	3.2900e-003	0.0977	0.0104	0.1080	0.0281	9.9400e-003	0.0380		352.9982	352.9982	7.0800e-003	0.0532	369.0388
Worker	0.0854	0.0744	0.7536	1.7900e-003	0.2044	1.3500e-003	0.2057	0.0542	1.2500e-003	0.0554		181.2955	181.2955	6.1300e-003	6.1900e-003	183.2920
Total	**0.1327**	**1.7751**	**1.0989**	**6.6800e-003**	**0.3411**	**0.0161**	**0.3572**	**0.0930**	**0.0153**	**0.1083**		**708.7717**	**708.7717**	**0.0181**	**0.0871**	**735.1668**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Brackney North: Carrier pipeline staging area prep - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6816	5.0169	8.2061	0.0129		0.2357	0.2357		0.2220	0.2220		1,207.5083	1,207.5083	0.3483		1,216.2147
Total	**0.6816**	**5.0169**	**8.2061**	**0.0129**	**0.0000**	**0.2357**	**0.2357**	**0.0000**	**0.2220**	**0.2220**		**1,207.5083**	**1,207.5083**	**0.3483**		**1,216.2147**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.3900e-003	0.1267	0.0180	3.6000e-004	8.6800e-003	9.6000e-004	9.6300e-003	2.3700e-003	9.1000e-004	3.2900e-003		38.7000	38.7000	1.0900e-003	6.1300e-003	40.5538
Vendor	0.0183	0.5647	0.1319	1.6400e-003	0.0488	5.2000e-003	0.0540	0.0140	4.9700e-003	0.0190		176.4991	176.4991	3.5400e-003	0.0266	184.5194
Worker	0.0533	0.0465	0.4710	1.1200e-003	0.1277	8.5000e-004	0.1286	0.0339	7.8000e-004	0.0347		113.3097	113.3097	3.8300e-003	3.8700e-003	114.5575
Total	**0.0740**	**0.7379**	**0.6210**	**3.1200e-003**	**0.1852**	**7.0100e-003**	**0.1922**	**0.0503**	**6.6600e-003**	**0.0570**		**328.5088**	**328.5088**	**8.4600e-003**	**0.0366**	**339.6308**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Brackney North: Carrier pipeline staging area prep - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6816	5.0169	8.2061	0.0129		0.2357	0.2357		0.2220	0.2220	0.0000	1,207.5083	1,207.5083	0.3483		1,216.2147
Total	**0.6816**	**5.0169**	**8.2061**	**0.0129**	**0.0000**	**0.2357**	**0.2357**	**0.0000**	**0.2220**	**0.2220**	**0.0000**	**1,207.5083**	**1,207.5083**	**0.3483**		**1,216.2147**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.3900e-003	0.1267	0.0180	3.6000e-004	8.6800e-003	9.6000e-004	9.6300e-003	2.3700e-003	9.1000e-004	3.2900e-003		38.7000	38.7000	1.0900e-003	6.1300e-003	40.5538
Vendor	0.0183	0.5647	0.1319	1.6400e-003	0.0488	5.2000e-003	0.0540	0.0140	4.9700e-003	0.0190		176.4991	176.4991	3.5400e-003	0.0266	184.5194
Worker	0.0533	0.0465	0.4710	1.1200e-003	0.1277	8.5000e-004	0.1286	0.0339	7.8000e-004	0.0347		113.3097	113.3097	3.8300e-003	3.8700e-003	114.5575
Total	**0.0740**	**0.7379**	**0.6210**	**3.1200e-003**	**0.1852**	**7.0100e-003**	**0.1922**	**0.0503**	**6.6600e-003**	**0.0570**		**328.5088**	**328.5088**	**8.4600e-003**	**0.0366**	**339.6308**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Brackney North: HDD (pullback) - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	10.5998	93.0901	132.2389	0.2381		4.6379	4.6379		4.4671	4.4671		22,820.0576	22,820.0576	4.5638		22,934.1533
Total	**10.5998**	**93.0901**	**132.2389**	**0.2381**		**4.6379**	**4.6379**		**4.4671**	**4.4671**		**22,820.0576**	**22,820.0576**	**4.5638**		**22,934.1533**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0550	2.9145	0.4150	8.1800e-003	0.1996	0.0220	0.2215	0.0546	0.0210	0.0756		890.1003	890.1003	0.0250	0.1410	932.7382
Vendor	0.0183	0.5647	0.1319	1.6400e-003	0.0488	5.2000e-003	0.0540	0.0140	4.9700e-003	0.0190		176.4991	176.4991	3.5400e-003	0.0266	184.5194
Worker	0.0854	0.0744	0.7536	1.7900e-003	0.2044	1.3500e-003	0.2057	0.0542	1.2500e-003	0.0554		181.2955	181.2955	6.1300e-003	6.1900e-003	183.2920
Total	**0.1587**	**3.5536**	**1.3005**	**0.0116**	**0.4528**	**0.0285**	**0.4813**	**0.1228**	**0.0273**	**0.1500**		**1,247.8948**	**1,247.8948**	**0.0347**	**0.1738**	**1,300.5496**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Brackney North: HDD (pullback) - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	10.5998	93.0901	132.2389	0.2381		4.6379	4.6379		4.4671	4.4671	0.0000	22,820.0576	22,820.0576	4.5638		22,934.1533
Total	**10.5998**	**93.0901**	**132.2389**	**0.2381**		**4.6379**	**4.6379**		**4.4671**	**4.4671**	**0.0000**	**22,820.0576**	**22,820.0576**	**4.5638**		**22,934.1533**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0550	2.9145	0.4150	8.1800e-003	0.1996	0.0220	0.2215	0.0546	0.0210	0.0756		890.1003	890.1003	0.0250	0.1410	932.7382
Vendor	0.0183	0.5647	0.1319	1.6400e-003	0.0488	5.2000e-003	0.0540	0.0140	4.9700e-003	0.0190		176.4991	176.4991	3.5400e-003	0.0266	184.5194
Worker	0.0854	0.0744	0.7536	1.7900e-003	0.2044	1.3500e-003	0.2057	0.0542	1.2500e-003	0.0554		181.2955	181.2955	6.1300e-003	6.1900e-003	183.2920
Total	**0.1587**	**3.5536**	**1.3005**	**0.0116**	**0.4528**	**0.0285**	**0.4813**	**0.1228**	**0.0273**	**0.1500**		**1,247.8948**	**1,247.8948**	**0.0347**	**0.1738**	**1,300.5496**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Brackney North: Tie-in pipeline construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0306	8.8023	12.2412	0.0191		0.4338	0.4338		0.4042	0.4042		1,811.3232	1,811.3232	0.5435		1,824.9117
Total	**1.0306**	**8.8023**	**12.2412**	**0.0191**		**0.4338**	**0.4338**		**0.4042**	**0.4042**		**1,811.3232**	**1,811.3232**	**0.5435**		**1,824.9117**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0478	2.5344	0.3609	7.1100e-003	0.1735	0.0191	0.1926	0.0474	0.0183	0.0657		774.0002	774.0002	0.0217	0.1226	811.0767
Vendor	0.0366	1.1293	0.2639	3.2900e-003	0.0977	0.0104	0.1080	0.0281	9.9400e-003	0.0380		352.9982	352.9982	7.0800e-003	0.0532	369.0388
Worker	0.0854	0.0744	0.7536	1.7900e-003	0.2044	1.3500e-003	0.2057	0.0542	1.2500e-003	0.0554		181.2955	181.2955	6.1300e-003	6.1900e-003	183.2920
Total	**0.1698**	**3.7381**	**1.3784**	**0.0122**	**0.4756**	**0.0309**	**0.5064**	**0.1297**	**0.0295**	**0.1592**		**1,308.2939**	**1,308.2939**	**0.0350**	**0.1820**	**1,363.4075**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Brackney North: Tie-in pipeline construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0306	8.8023	12.2412	0.0191		0.4338	0.4338		0.4042	0.4042	0.0000	1,811.3232	1,811.3232	0.5435		1,824.9117
Total	**1.0306**	**8.8023**	**12.2412**	**0.0191**		**0.4338**	**0.4338**		**0.4042**	**0.4042**	**0.0000**	**1,811.3232**	**1,811.3232**	**0.5435**		**1,824.9117**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0478	2.5344	0.3609	7.1100e-003	0.1735	0.0191	0.1926	0.0474	0.0183	0.0657		774.0002	774.0002	0.0217	0.1226	811.0767
Vendor	0.0366	1.1293	0.2639	3.2900e-003	0.0977	0.0104	0.1080	0.0281	9.9400e-003	0.0380		352.9982	352.9982	7.0800e-003	0.0532	369.0388
Worker	0.0854	0.0744	0.7536	1.7900e-003	0.2044	1.3500e-003	0.2057	0.0542	1.2500e-003	0.0554		181.2955	181.2955	6.1300e-003	6.1900e-003	183.2920
Total	**0.1698**	**3.7381**	**1.3784**	**0.0122**	**0.4756**	**0.0309**	**0.5064**	**0.1297**	**0.0295**	**0.1592**		**1,308.2939**	**1,308.2939**	**0.0350**	**0.1820**	**1,363.4075**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Brackney North: Tie-in pipeline construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9595	8.0650	12.2278	0.0191		0.3860	0.3860		0.3596	0.3596		1,811.3754	1,811.3754	0.5414		1,824.9096
Total	**0.9595**	**8.0650**	**12.2278**	**0.0191**		**0.3860**	**0.3860**		**0.3596**	**0.3596**		**1,811.3754**	**1,811.3754**	**0.5414**		**1,824.9096**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0302	2.2059	0.3270	6.8700e-003	0.1736	0.0143	0.1879	0.0475	0.0137	0.0612		748.6619	748.6619	0.0212	0.1186	784.5348
Vendor	0.0219	0.9629	0.2257	3.1800e-003	0.0977	5.2400e-003	0.1029	0.0281	5.0200e-003	0.0331		341.6074	341.6074	6.4400e-003	0.0514	357.0980
Worker	0.0798	0.0655	0.6888	1.7400e-003	0.2044	1.2700e-003	0.2056	0.0542	1.1700e-003	0.0554		175.8898	175.8898	5.5000e-003	5.6700e-003	177.7162
Total	**0.1319**	**3.2343**	**1.2415**	**0.0118**	**0.4756**	**0.0208**	**0.4964**	**0.1297**	**0.0199**	**0.1496**		**1,266.1590**	**1,266.1590**	**0.0331**	**0.1757**	**1,319.3490**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Brackney North: Tie-in pipeline construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9595	8.0650	12.2278	0.0191		0.3860	0.3860		0.3596	0.3596	0.0000	1,811.3754	1,811.3754	0.5414		1,824.9096
Total	**0.9595**	**8.0650**	**12.2278**	**0.0191**		**0.3860**	**0.3860**		**0.3596**	**0.3596**	**0.0000**	**1,811.3754**	**1,811.3754**	**0.5414**		**1,824.9096**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0302	2.2059	0.3270	6.8700e-003	0.1736	0.0143	0.1879	0.0475	0.0137	0.0612		748.6619	748.6619	0.0212	0.1186	784.5348
Vendor	0.0219	0.9629	0.2257	3.1800e-003	0.0977	5.2400e-003	0.1029	0.0281	5.0200e-003	0.0331		341.6074	341.6074	6.4400e-003	0.0514	357.0980
Worker	0.0798	0.0655	0.6888	1.7400e-003	0.2044	1.2700e-003	0.2056	0.0542	1.1700e-003	0.0554		175.8898	175.8898	5.5000e-003	5.6700e-003	177.7162
Total	**0.1319**	**3.2343**	**1.2415**	**0.0118**	**0.4756**	**0.0208**	**0.4964**	**0.1297**	**0.0199**	**0.1496**		**1,266.1590**	**1,266.1590**	**0.0331**	**0.1757**	**1,319.3490**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.9 NCP FBPS to Graham Hill WTP: Staging area - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1881	1.7680	2.3567	3.4900e-003		0.0845	0.0845		0.0784	0.0784		332.0467	332.0467	0.1008		334.5668
Total	**0.1881**	**1.7680**	**2.3567**	**3.4900e-003**	**0.0000**	**0.0845**	**0.0845**	**0.0000**	**0.0784**	**0.0784**		**332.0467**	**332.0467**	**0.1008**		**334.5668**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.2000e-003	0.3611	0.0846	1.1900e-003	0.0366	1.9700e-003	0.0386	0.0105	1.8800e-003	0.0124		128.1028	128.1028	2.4200e-003	0.0193	133.9117
Worker	0.0299	0.0246	0.2583	6.5000e-004	0.0766	4.8000e-004	0.0771	0.0203	4.4000e-004	0.0208		65.9587	65.9587	2.0600e-003	2.1300e-003	66.6436
Total	**0.0381**	**0.3857**	**0.3430**	**1.8400e-003**	**0.1133**	**2.4500e-003**	**0.1157**	**0.0309**	**2.3200e-003**	**0.0332**		**194.0614**	**194.0614**	**4.4800e-003**	**0.0214**	**200.5553**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.9 NCP FBPS to Graham Hill WTP: Staging area - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1881	1.7680	2.3567	3.4900e-003		0.0845	0.0845		0.0784	0.0784	0.0000	332.0467	332.0467	0.1008		334.5668
Total	**0.1881**	**1.7680**	**2.3567**	**3.4900e-003**	**0.0000**	**0.0845**	**0.0845**	**0.0000**	**0.0784**	**0.0784**	**0.0000**	**332.0467**	**332.0467**	**0.1008**		**334.5668**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.2000e-003	0.3611	0.0846	1.1900e-003	0.0366	1.9700e-003	0.0386	0.0105	1.8800e-003	0.0124		128.1028	128.1028	2.4200e-003	0.0193	133.9117
Worker	0.0299	0.0246	0.2583	6.5000e-004	0.0766	4.8000e-004	0.0771	0.0203	4.4000e-004	0.0208		65.9587	65.9587	2.0600e-003	2.1300e-003	66.6436
Total	**0.0381**	**0.3857**	**0.3430**	**1.8400e-003**	**0.1133**	**2.4500e-003**	**0.1157**	**0.0309**	**2.3200e-003**	**0.0332**		**194.0614**	**194.0614**	**4.4800e-003**	**0.0214**	**200.5553**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.10 Brackney North: Abandon existing pipeline - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4190	12.0419	17.2257	0.0294		0.5782	0.5782		0.5661	0.5661		2,771.8185	2,771.8185	0.3542		2,780.6731
Total	**1.4190**	**12.0419**	**17.2257**	**0.0294**		**0.5782**	**0.5782**		**0.5661**	**0.5661**		**2,771.8185**	**2,771.8185**	**0.3542**		**2,780.6731**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0322	2.3530	0.3488	7.3300e-003	0.1851	0.0153	0.2004	0.0506	0.0146	0.0652		798.5727	798.5727	0.0226	0.1265	836.8372
Vendor	0.0164	0.7222	0.1693	2.3900e-003	0.0732	3.9300e-003	0.0772	0.0211	3.7600e-003	0.0248		256.2055	256.2055	4.8300e-003	0.0386	267.8235
Worker	0.0798	0.0655	0.6888	1.7400e-003	0.2044	1.2700e-003	0.2056	0.0542	1.1700e-003	0.0554		175.8898	175.8898	5.5000e-003	5.6700e-003	177.7162
Total	**0.1284**	**3.1407**	**1.2069**	**0.0115**	**0.4627**	**0.0205**	**0.4832**	**0.1259**	**0.0195**	**0.1454**		**1,230.6680**	**1,230.6680**	**0.0329**	**0.1708**	**1,282.3768**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.10 Brackney North: Abandon existing pipeline - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4190	12.0419	17.2257	0.0294		0.5782	0.5782		0.5661	0.5661	0.0000	2,771.8185	2,771.8185	0.3542		2,780.6731
Total	**1.4190**	**12.0419**	**17.2257**	**0.0294**		**0.5782**	**0.5782**		**0.5661**	**0.5661**	**0.0000**	**2,771.8185**	**2,771.8185**	**0.3542**		**2,780.6731**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0322	2.3530	0.3488	7.3300e-003	0.1851	0.0153	0.2004	0.0506	0.0146	0.0652		798.5727	798.5727	0.0226	0.1265	836.8372
Vendor	0.0164	0.7222	0.1693	2.3900e-003	0.0732	3.9300e-003	0.0772	0.0211	3.7600e-003	0.0248		256.2055	256.2055	4.8300e-003	0.0386	267.8235
Worker	0.0798	0.0655	0.6888	1.7400e-003	0.2044	1.2700e-003	0.2056	0.0542	1.1700e-003	0.0554		175.8898	175.8898	5.5000e-003	5.6700e-003	177.7162
Total	**0.1284**	**3.1407**	**1.2069**	**0.0115**	**0.4627**	**0.0205**	**0.4832**	**0.1259**	**0.0195**	**0.1454**		**1,230.6680**	**1,230.6680**	**0.0329**	**0.1708**	**1,282.3768**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.11 Brackney North: Restoration - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2431	11.1262	17.0975	0.0258		0.5748	0.5748		0.5364	0.5364		2,486.8437	2,486.8437	0.7054		2,504.4781
Total	**1.2431**	**11.1262**	**17.0975**	**0.0258**	**0.0000**	**0.5748**	**0.5748**	**0.0000**	**0.5364**	**0.5364**		**2,486.8437**	**2,486.8437**	**0.7054**		**2,504.4781**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0121	0.8824	0.1308	2.7500e-003	0.0694	5.7300e-003	0.0752	0.0190	5.4800e-003	0.0245		299.4648	299.4648	8.4600e-003	0.0474	313.8139
Vendor	0.0164	0.7222	0.1693	2.3900e-003	0.0732	3.9300e-003	0.0772	0.0211	3.7600e-003	0.0248		256.2055	256.2055	4.8300e-003	0.0386	267.8235
Worker	0.0798	0.0655	0.6888	1.7400e-003	0.2044	1.2700e-003	0.2056	0.0542	1.1700e-003	0.0554		175.8898	175.8898	5.5000e-003	5.6700e-003	177.7162
Total	**0.1083**	**1.6701**	**0.9889**	**6.8800e-003**	**0.3470**	**0.0109**	**0.3580**	**0.0943**	**0.0104**	**0.1047**		**731.5600**	**731.5600**	**0.0188**	**0.0917**	**759.3536**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.11 Brackney North: Restoration - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2431	11.1262	17.0975	0.0258		0.5748	0.5748		0.5364	0.5364	0.0000	2,486.8437	2,486.8437	0.7054		2,504.4781
Total	**1.2431**	**11.1262**	**17.0975**	**0.0258**	**0.0000**	**0.5748**	**0.5748**	**0.0000**	**0.5364**	**0.5364**	**0.0000**	**2,486.8437**	**2,486.8437**	**0.7054**		**2,504.4781**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0121	0.8824	0.1308	2.7500e-003	0.0694	5.7300e-003	0.0752	0.0190	5.4800e-003	0.0245		299.4648	299.4648	8.4600e-003	0.0474	313.8139
Vendor	0.0164	0.7222	0.1693	2.3900e-003	0.0732	3.9300e-003	0.0772	0.0211	3.7600e-003	0.0248		256.2055	256.2055	4.8300e-003	0.0386	267.8235
Worker	0.0798	0.0655	0.6888	1.7400e-003	0.2044	1.2700e-003	0.2056	0.0542	1.1700e-003	0.0554		175.8898	175.8898	5.5000e-003	5.6700e-003	177.7162
Total	**0.1083**	**1.6701**	**0.9889**	**6.8800e-003**	**0.3470**	**0.0109**	**0.3580**	**0.0943**	**0.0104**	**0.1047**		**731.5600**	**731.5600**	**0.0188**	**0.0917**	**759.3536**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.12 Brackney North: Demobilization - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6801	6.1686	10.9782	0.0166		0.3032	0.3032		0.2790	0.2790		1,603.3643	1,603.3643	0.5186		1,616.3283
Total	**0.6801**	**6.1686**	**10.9782**	**0.0166**	**0.0000**	**0.3032**	**0.3032**	**0.0000**	**0.2790**	**0.2790**		**1,603.3643**	**1,603.3643**	**0.5186**		**1,616.3283**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0121	0.8824	0.1308	2.7500e-003	0.0694	5.7300e-003	0.0752	0.0190	5.4800e-003	0.0245		299.4648	299.4648	8.4600e-003	0.0474	313.8139
Vendor	0.0164	0.7222	0.1693	2.3900e-003	0.0732	3.9300e-003	0.0772	0.0211	3.7600e-003	0.0248		256.2055	256.2055	4.8300e-003	0.0386	267.8235
Worker	0.0998	0.0819	0.8611	2.1700e-003	0.2555	1.5900e-003	0.2571	0.0678	1.4700e-003	0.0692		219.8622	219.8622	6.8700e-003	7.0800e-003	222.1452
Total	**0.1283**	**1.6864**	**1.1611**	**7.3100e-003**	**0.3981**	**0.0113**	**0.4094**	**0.1078**	**0.0107**	**0.1185**		**775.5325**	**775.5325**	**0.0202**	**0.0931**	**803.7826**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.12 Brackney North: Demobilization - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6801	6.1686	10.9782	0.0166		0.3032	0.3032		0.2790	0.2790	0.0000	1,603.3643	1,603.3643	0.5186		1,616.3283
Total	**0.6801**	**6.1686**	**10.9782**	**0.0166**	**0.0000**	**0.3032**	**0.3032**	**0.0000**	**0.2790**	**0.2790**	**0.0000**	**1,603.3643**	**1,603.3643**	**0.5186**		**1,616.3283**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0121	0.8824	0.1308	2.7500e-003	0.0694	5.7300e-003	0.0752	0.0190	5.4800e-003	0.0245		299.4648	299.4648	8.4600e-003	0.0474	313.8139
Vendor	0.0164	0.7222	0.1693	2.3900e-003	0.0732	3.9300e-003	0.0772	0.0211	3.7600e-003	0.0248		256.2055	256.2055	4.8300e-003	0.0386	267.8235
Worker	0.0998	0.0819	0.8611	2.1700e-003	0.2555	1.5900e-003	0.2571	0.0678	1.4700e-003	0.0692		219.8622	219.8622	6.8700e-003	7.0800e-003	222.1452
Total	**0.1283**	**1.6864**	**1.1611**	**7.3100e-003**	**0.3981**	**0.0113**	**0.4094**	**0.1078**	**0.0107**	**0.1185**		**775.5325**	**775.5325**	**0.0202**	**0.0931**	**803.7826**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.13 Big Trees RR Crossing: Shaft excavation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.0600e-003	0.0000	4.0600e-003	6.1000e-004	0.0000	6.1000e-004			0.0000			0.0000
Off-Road	0.2621	2.0132	3.5086	5.9200e-003		0.0932	0.0932		0.0871	0.0871		561.0460	561.0460	0.1683		565.2531
Total	**0.2621**	**2.0132**	**3.5086**	**5.9200e-003**	**4.0600e-003**	**0.0932**	**0.0972**	**6.1000e-004**	**0.0871**	**0.0877**		**561.0460**	**561.0460**	**0.1683**		**565.2531**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0199	1.4559	0.2158	4.5400e-003	0.1146	9.4500e-003	0.1240	0.0313	9.0400e-003	0.0404		494.1168	494.1168	0.0140	0.0783	517.7930
Vendor	0.0109	0.4815	0.1129	1.5900e-003	0.0488	2.6200e-003	0.0515	0.0140	2.5100e-003	0.0166		170.8037	170.8037	3.2200e-003	0.0257	178.5490
Worker	0.0200	0.0164	0.1722	4.3000e-004	0.0511	3.2000e-004	0.0514	0.0136	2.9000e-004	0.0138		43.9724	43.9724	1.3700e-003	1.4200e-003	44.4291
Total	**0.0508**	**1.9537**	**0.5009**	**6.5600e-003**	**0.2145**	**0.0124**	**0.2269**	**0.0589**	**0.0118**	**0.0708**		**708.8930**	**708.8930**	**0.0186**	**0.1054**	**740.7710**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.13 Big Trees RR Crossing: Shaft excavation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.8300e-003	0.0000	1.8300e-003	2.8000e-004	0.0000	2.8000e-004			0.0000			0.0000
Off-Road	0.2621	2.0132	3.5086	5.9200e-003		0.0932	0.0932		0.0871	0.0871	0.0000	561.0460	561.0460	0.1683		565.2531
Total	**0.2621**	**2.0132**	**3.5086**	**5.9200e-003**	**1.8300e-003**	**0.0932**	**0.0950**	**2.8000e-004**	**0.0871**	**0.0874**	**0.0000**	**561.0460**	**561.0460**	**0.1683**		**565.2531**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0199	1.4559	0.2158	4.5400e-003	0.1146	9.4500e-003	0.1240	0.0313	9.0400e-003	0.0404		494.1168	494.1168	0.0140	0.0783	517.7930
Vendor	0.0109	0.4815	0.1129	1.5900e-003	0.0488	2.6200e-003	0.0515	0.0140	2.5100e-003	0.0166		170.8037	170.8037	3.2200e-003	0.0257	178.5490
Worker	0.0200	0.0164	0.1722	4.3000e-004	0.0511	3.2000e-004	0.0514	0.0136	2.9000e-004	0.0138		43.9724	43.9724	1.3700e-003	1.4200e-003	44.4291
Total	**0.0508**	**1.9537**	**0.5009**	**6.5600e-003**	**0.2145**	**0.0124**	**0.2269**	**0.0589**	**0.0118**	**0.0708**		**708.8930**	**708.8930**	**0.0186**	**0.1054**	**740.7710**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.14 Big Trees RR Crossing: Boring and casing - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2151	2.0396	2.0329	9.4600e-003		0.0660	0.0660		0.0608	0.0608		915.4033	915.4033	0.2961		922.8048
Total	**0.2151**	**2.0396**	**2.0329**	**9.4600e-003**		**0.0660**	**0.0660**		**0.0608**	**0.0608**		**915.4033**	**915.4033**	**0.2961**		**922.8048**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7300e-003	0.1204	0.0282	4.0000e-004	0.0122	6.6000e-004	0.0129	3.5100e-003	6.3000e-004	4.1400e-003		42.7009	42.7009	8.1000e-004	6.4300e-003	44.6373
Worker	9.9800e-003	8.1900e-003	0.0861	2.2000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		21.9862	21.9862	6.9000e-004	7.1000e-004	22.2145
Total	**0.0127**	**0.1286**	**0.1143**	**6.2000e-004**	**0.0378**	**8.2000e-004**	**0.0386**	**0.0103**	**7.8000e-004**	**0.0111**		**64.6871**	**64.6871**	**1.5000e-003**	**7.1400e-003**	**66.8518**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.14 Big Trees RR Crossing: Boring and casing - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2151	2.0396	2.0329	9.4600e-003		0.0660	0.0660		0.0608	0.0608	0.0000	915.4033	915.4033	0.2961		922.8048
Total	**0.2151**	**2.0396**	**2.0329**	**9.4600e-003**		**0.0660**	**0.0660**		**0.0608**	**0.0608**	**0.0000**	**915.4033**	**915.4033**	**0.2961**		**922.8048**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7300e-003	0.1204	0.0282	4.0000e-004	0.0122	6.6000e-004	0.0129	3.5100e-003	6.3000e-004	4.1400e-003		42.7009	42.7009	8.1000e-004	6.4300e-003	44.6373
Worker	9.9800e-003	8.1900e-003	0.0861	2.2000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		21.9862	21.9862	6.9000e-004	7.1000e-004	22.2145
Total	**0.0127**	**0.1286**	**0.1143**	**6.2000e-004**	**0.0378**	**8.2000e-004**	**0.0386**	**0.0103**	**7.8000e-004**	**0.0111**		**64.6871**	**64.6871**	**1.5000e-003**	**7.1400e-003**	**66.8518**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.15 Big Trees RR Crossing: Pipe install - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1514	1.5357	2.2313	3.1200e-003		0.0758	0.0758		0.0698	0.0698		301.5765	301.5765	0.0975		304.0149
Total	**0.1514**	**1.5357**	**2.2313**	**3.1200e-003**		**0.0758**	**0.0758**		**0.0698**	**0.0698**		**301.5765**	**301.5765**	**0.0975**		**304.0149**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7300e-003	0.1204	0.0282	4.0000e-004	0.0122	6.6000e-004	0.0129	3.5100e-003	6.3000e-004	4.1400e-003		42.7009	42.7009	8.1000e-004	6.4300e-003	44.6373
Worker	9.9800e-003	8.1900e-003	0.0861	2.2000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		21.9862	21.9862	6.9000e-004	7.1000e-004	22.2145
Total	**0.0127**	**0.1286**	**0.1143**	**6.2000e-004**	**0.0378**	**8.2000e-004**	**0.0386**	**0.0103**	**7.8000e-004**	**0.0111**		**64.6871**	**64.6871**	**1.5000e-003**	**7.1400e-003**	**66.8518**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.15 Big Trees RR Crossing: Pipe install - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1514	1.5357	2.2313	3.1200e-003		0.0758	0.0758		0.0698	0.0698	0.0000	301.5765	301.5765	0.0975		304.0149
Total	**0.1514**	**1.5357**	**2.2313**	**3.1200e-003**		**0.0758**	**0.0758**		**0.0698**	**0.0698**	**0.0000**	**301.5765**	**301.5765**	**0.0975**		**304.0149**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7300e-003	0.1204	0.0282	4.0000e-004	0.0122	6.6000e-004	0.0129	3.5100e-003	6.3000e-004	4.1400e-003		42.7009	42.7009	8.1000e-004	6.4300e-003	44.6373
Worker	9.9800e-003	8.1900e-003	0.0861	2.2000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		21.9862	21.9862	6.9000e-004	7.1000e-004	22.2145
Total	**0.0127**	**0.1286**	**0.1143**	**6.2000e-004**	**0.0378**	**8.2000e-004**	**0.0386**	**0.0103**	**7.8000e-004**	**0.0111**		**64.6871**	**64.6871**	**1.5000e-003**	**7.1400e-003**	**66.8518**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.16 Big Trees RR Crossing: Grout - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0588	0.3682	0.3084	7.1000e-004		0.0143	0.0143		0.0143	0.0143		50.5163	50.5163	5.2400e-003		50.6474
Total	**0.0588**	**0.3682**	**0.3084**	**7.1000e-004**		**0.0143**	**0.0143**		**0.0143**	**0.0143**		**50.5163**	**50.5163**	**5.2400e-003**		**50.6474**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.0300e-003	0.4412	0.0654	1.3700e-003	0.0347	2.8600e-003	0.0376	9.4900e-003	2.7400e-003	0.0122		149.7324	149.7324	4.2300e-003	0.0237	156.9070
Vendor	2.7300e-003	0.1204	0.0282	4.0000e-004	0.0122	6.6000e-004	0.0129	3.5100e-003	6.3000e-004	4.1400e-003		42.7009	42.7009	8.1000e-004	6.4300e-003	44.6373
Worker	9.9800e-003	8.1900e-003	0.0861	2.2000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		21.9862	21.9862	6.9000e-004	7.1000e-004	22.2145
Total	**0.0187**	**0.5697**	**0.1797**	**1.9900e-003**	**0.0725**	**3.6800e-003**	**0.0761**	**0.0198**	**3.5200e-003**	**0.0233**		**214.4195**	**214.4195**	**5.7300e-003**	**0.0309**	**223.7587**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.16 Big Trees RR Crossing: Grout - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0588	0.3682	0.3084	7.1000e-004		0.0143	0.0143		0.0143	0.0143	0.0000	50.5163	50.5163	5.2400e-003		50.6474
Total	**0.0588**	**0.3682**	**0.3084**	**7.1000e-004**		**0.0143**	**0.0143**		**0.0143**	**0.0143**	**0.0000**	**50.5163**	**50.5163**	**5.2400e-003**		**50.6474**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.0300e-003	0.4412	0.0654	1.3700e-003	0.0347	2.8600e-003	0.0376	9.4900e-003	2.7400e-003	0.0122		149.7324	149.7324	4.2300e-003	0.0237	156.9070
Vendor	2.7300e-003	0.1204	0.0282	4.0000e-004	0.0122	6.6000e-004	0.0129	3.5100e-003	6.3000e-004	4.1400e-003		42.7009	42.7009	8.1000e-004	6.4300e-003	44.6373
Worker	9.9800e-003	8.1900e-003	0.0861	2.2000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		21.9862	21.9862	6.9000e-004	7.1000e-004	22.2145
Total	**0.0187**	**0.5697**	**0.1797**	**1.9900e-003**	**0.0725**	**3.6800e-003**	**0.0761**	**0.0198**	**3.5200e-003**	**0.0233**		**214.4195**	**214.4195**	**5.7300e-003**	**0.0309**	**223.7587**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.17 Big Trees RR Crossing: Backfill - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.4700e-003	0.2407	0.0564	8.0000e-004	0.0244	1.3100e-003	0.0257	7.0200e-003	1.2500e-003	8.2800e-003		85.4018	85.4018	1.6100e-003	0.0129	89.2745
Worker	9.9800e-003	8.1900e-003	0.0861	2.2000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		21.9862	21.9862	6.9000e-004	7.1000e-004	22.2145
Total	**0.0155**	**0.2489**	**0.1425**	**1.0200e-003**	**0.0500**	**1.4700e-003**	**0.0514**	**0.0138**	**1.4000e-003**	**0.0152**		**107.3881**	**107.3881**	**2.3000e-003**	**0.0136**	**111.4890**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.17 Big Trees RR Crossing: Backfill - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.4700e-003	0.2407	0.0564	8.0000e-004	0.0244	1.3100e-003	0.0257	7.0200e-003	1.2500e-003	8.2800e-003		85.4018	85.4018	1.6100e-003	0.0129	89.2745
Worker	9.9800e-003	8.1900e-003	0.0861	2.2000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		21.9862	21.9862	6.9000e-004	7.1000e-004	22.2145
Total	**0.0155**	**0.2489**	**0.1425**	**1.0200e-003**	**0.0500**	**1.4700e-003**	**0.0514**	**0.0138**	**1.4000e-003**	**0.0152**		**107.3881**	**107.3881**	**2.3000e-003**	**0.0136**	**111.4890**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.18 Zayante Creek Crossing: CIDH Piles - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2739	2.4078	2.3412	0.0102		0.0803	0.0803		0.0751	0.0751		965.9196	965.9196	0.3013		973.4522
Total	**0.2739**	**2.4078**	**2.3412**	**0.0102**		**0.0803**	**0.0803**		**0.0751**	**0.0751**		**965.9196**	**965.9196**	**0.3013**		**973.4522**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.6200e-003	0.2647	0.0392	8.2000e-004	0.0208	1.7200e-003	0.0225	5.6900e-003	1.6400e-003	7.3400e-003		89.8394	89.8394	2.5400e-003	0.0142	94.1442
Vendor	5.4700e-003	0.2407	0.0564	8.0000e-004	0.0244	1.3100e-003	0.0257	7.0200e-003	1.2500e-003	8.2800e-003		85.4018	85.4018	1.6100e-003	0.0129	89.2745
Worker	0.0399	0.0328	0.3444	8.7000e-004	0.1022	6.4000e-004	0.1028	0.0271	5.9000e-004	0.0277		87.9449	87.9449	2.7500e-003	2.8300e-003	88.8581
Total	**0.0490**	**0.5382**	**0.4401**	**2.4900e-003**	**0.1474**	**3.6700e-003**	**0.1511**	**0.0398**	**3.4800e-003**	**0.0433**		**263.1862**	**263.1862**	**6.9000e-003**	**0.0299**	**272.2768**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.18 Zayante Creek Crossing: CIDH Piles - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2739	2.4078	2.3412	0.0102		0.0803	0.0803		0.0751	0.0751	0.0000	965.9196	965.9196	0.3013		973.4522
Total	**0.2739**	**2.4078**	**2.3412**	**0.0102**		**0.0803**	**0.0803**		**0.0751**	**0.0751**	**0.0000**	**965.9196**	**965.9196**	**0.3013**		**973.4522**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.6200e-003	0.2647	0.0392	8.2000e-004	0.0208	1.7200e-003	0.0225	5.6900e-003	1.6400e-003	7.3400e-003		89.8394	89.8394	2.5400e-003	0.0142	94.1442
Vendor	5.4700e-003	0.2407	0.0564	8.0000e-004	0.0244	1.3100e-003	0.0257	7.0200e-003	1.2500e-003	8.2800e-003		85.4018	85.4018	1.6100e-003	0.0129	89.2745
Worker	0.0399	0.0328	0.3444	8.7000e-004	0.1022	6.4000e-004	0.1028	0.0271	5.9000e-004	0.0277		87.9449	87.9449	2.7500e-003	2.8300e-003	88.8581
Total	**0.0490**	**0.5382**	**0.4401**	**2.4900e-003**	**0.1474**	**3.6700e-003**	**0.1511**	**0.0398**	**3.4800e-003**	**0.0433**		**263.1862**	**263.1862**	**6.9000e-003**	**0.0299**	**272.2768**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.19 Zayante Creek Crossing: Pier scour protect - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1789	1.7099	2.3254	3.4000e-003		0.0823	0.0823		0.0763	0.0763		324.4291	324.4291	0.1000		326.9288
Total	**0.1789**	**1.7099**	**2.3254**	**3.4000e-003**		**0.0823**	**0.0823**		**0.0763**	**0.0763**		**324.4291**	**324.4291**	**0.1000**		**326.9288**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0190	1.3897	0.2060	4.3300e-003	0.1093	9.0200e-003	0.1184	0.0299	8.6300e-003	0.0385		471.6570	471.6570	0.0133	0.0747	494.2570
Vendor	8.2000e-003	0.3611	0.0846	1.1900e-003	0.0366	1.9700e-003	0.0386	0.0105	1.8800e-003	0.0124		128.1028	128.1028	2.4200e-003	0.0193	133.9117
Worker	0.0299	0.0246	0.2583	6.5000e-004	0.0766	4.8000e-004	0.0771	0.0203	4.4000e-004	0.0208		65.9587	65.9587	2.0600e-003	2.1300e-003	66.6436
Total	**0.0572**	**1.7754**	**0.5489**	**6.1700e-003**	**0.2226**	**0.0115**	**0.2341**	**0.0607**	**0.0110**	**0.0717**		**665.7184**	**665.7184**	**0.0178**	**0.0961**	**694.8123**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.19 Zayante Creek Crossing: Pier scour protect - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1789	1.7099	2.3254	3.4000e-003		0.0823	0.0823		0.0763	0.0763	0.0000	324.4291	324.4291	0.1000		326.9288
Total	**0.1789**	**1.7099**	**2.3254**	**3.4000e-003**		**0.0823**	**0.0823**		**0.0763**	**0.0763**	**0.0000**	**324.4291**	**324.4291**	**0.1000**		**326.9288**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0190	1.3897	0.2060	4.3300e-003	0.1093	9.0200e-003	0.1184	0.0299	8.6300e-003	0.0385		471.6570	471.6570	0.0133	0.0747	494.2570
Vendor	8.2000e-003	0.3611	0.0846	1.1900e-003	0.0366	1.9700e-003	0.0386	0.0105	1.8800e-003	0.0124		128.1028	128.1028	2.4200e-003	0.0193	133.9117
Worker	0.0299	0.0246	0.2583	6.5000e-004	0.0766	4.8000e-004	0.0771	0.0203	4.4000e-004	0.0208		65.9587	65.9587	2.0600e-003	2.1300e-003	66.6436
Total	**0.0572**	**1.7754**	**0.5489**	**6.1700e-003**	**0.2226**	**0.0115**	**0.2341**	**0.0607**	**0.0110**	**0.0717**		**665.7184**	**665.7184**	**0.0178**	**0.0961**	**694.8123**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.20 Zayante Creek Crossing: Pipe support - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1005	0.6912	0.7655	1.4900e-003		0.0304	0.0304		0.0304	0.0304		124.5995	124.5995	8.8900e-003		124.8219
Total	**0.1005**	**0.6912**	**0.7655**	**1.4900e-003**		**0.0304**	**0.0304**		**0.0304**	**0.0304**		**124.5995**	**124.5995**	**8.8900e-003**		**124.8219**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.0300e-003	0.4412	0.0654	1.3700e-003	0.0347	2.8600e-003	0.0376	9.4900e-003	2.7400e-003	0.0122		149.7324	149.7324	4.2300e-003	0.0237	156.9070
Vendor	2.7300e-003	0.1204	0.0282	4.0000e-004	0.0122	6.6000e-004	0.0129	3.5100e-003	6.3000e-004	4.1400e-003		42.7009	42.7009	8.1000e-004	6.4300e-003	44.6373
Worker	0.0399	0.0328	0.3444	8.7000e-004	0.1022	6.4000e-004	0.1028	0.0271	5.9000e-004	0.0277		87.9449	87.9449	2.7500e-003	2.8300e-003	88.8581
Total	**0.0487**	**0.5943**	**0.4380**	**2.6400e-003**	**0.1491**	**4.1600e-003**	**0.1533**	**0.0401**	**3.9600e-003**	**0.0441**		**280.3782**	**280.3782**	**7.7900e-003**	**0.0330**	**290.4023**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.20 Zayante Creek Crossing: Pipe support - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1005	0.6912	0.7655	1.4900e-003		0.0304	0.0304		0.0304	0.0304	0.0000	124.5995	124.5995	8.8900e-003		124.8219
Total	**0.1005**	**0.6912**	**0.7655**	**1.4900e-003**		**0.0304**	**0.0304**		**0.0304**	**0.0304**	**0.0000**	**124.5995**	**124.5995**	**8.8900e-003**		**124.8219**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	6.0300e-003	0.4412	0.0654	1.3700e-003	0.0347	2.8600e-003	0.0376	9.4900e-003	2.7400e-003	0.0122		149.7324	149.7324	4.2300e-003	0.0237	156.9070
Vendor	2.7300e-003	0.1204	0.0282	4.0000e-004	0.0122	6.6000e-004	0.0129	3.5100e-003	6.3000e-004	4.1400e-003		42.7009	42.7009	8.1000e-004	6.4300e-003	44.6373
Worker	0.0399	0.0328	0.3444	8.7000e-004	0.1022	6.4000e-004	0.1028	0.0271	5.9000e-004	0.0277		87.9449	87.9449	2.7500e-003	2.8300e-003	88.8581
Total	**0.0487**	**0.5943**	**0.4380**	**2.6400e-003**	**0.1491**	**4.1600e-003**	**0.1533**	**0.0401**	**3.9600e-003**	**0.0441**		**280.3782**	**280.3782**	**7.7900e-003**	**0.0330**	**290.4023**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.21 Zayante Creek Crossing: Install pipe span - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3514	3.8155	1.8344	5.7700e-003		0.1593	0.1593		0.1466	0.1466		558.8192	558.8192	0.1807		563.3376
Total	**0.3514**	**3.8155**	**1.8344**	**5.7700e-003**		**0.1593**	**0.1593**		**0.1466**	**0.1466**		**558.8192**	**558.8192**	**0.1807**		**563.3376**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7300e-003	0.1204	0.0282	4.0000e-004	0.0122	6.6000e-004	0.0129	3.5100e-003	6.3000e-004	4.1400e-003		42.7009	42.7009	8.1000e-004	6.4300e-003	44.6373
Worker	9.9800e-003	8.1900e-003	0.0861	2.2000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		21.9862	21.9862	6.9000e-004	7.1000e-004	22.2145
Total	**0.0127**	**0.1286**	**0.1143**	**6.2000e-004**	**0.0378**	**8.2000e-004**	**0.0386**	**0.0103**	**7.8000e-004**	**0.0111**		**64.6871**	**64.6871**	**1.5000e-003**	**7.1400e-003**	**66.8518**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.21 Zayante Creek Crossing: Install pipe span - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3514	3.8155	1.8344	5.7700e-003		0.1593	0.1593		0.1466	0.1466	0.0000	558.8192	558.8192	0.1807		563.3376
Total	**0.3514**	**3.8155**	**1.8344**	**5.7700e-003**		**0.1593**	**0.1593**		**0.1466**	**0.1466**	**0.0000**	**558.8192**	**558.8192**	**0.1807**		**563.3376**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7300e-003	0.1204	0.0282	4.0000e-004	0.0122	6.6000e-004	0.0129	3.5100e-003	6.3000e-004	4.1400e-003		42.7009	42.7009	8.1000e-004	6.4300e-003	44.6373
Worker	9.9800e-003	8.1900e-003	0.0861	2.2000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		21.9862	21.9862	6.9000e-004	7.1000e-004	22.2145
Total	**0.0127**	**0.1286**	**0.1143**	**6.2000e-004**	**0.0378**	**8.2000e-004**	**0.0386**	**0.0103**	**7.8000e-004**	**0.0111**		**64.6871**	**64.6871**	**1.5000e-003**	**7.1400e-003**	**66.8518**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.22 Zayante Creek Crossing: Install flex connect - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1514	1.5357	2.2313	3.1200e-003		0.0758	0.0758		0.0698	0.0698		301.5765	301.5765	0.0975		304.0149
Total	**0.1514**	**1.5357**	**2.2313**	**3.1200e-003**		**0.0758**	**0.0758**		**0.0698**	**0.0698**		**301.5765**	**301.5765**	**0.0975**		**304.0149**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.4700e-003	0.2407	0.0564	8.0000e-004	0.0244	1.3100e-003	0.0257	7.0200e-003	1.2500e-003	8.2800e-003		85.4018	85.4018	1.6100e-003	0.0129	89.2745
Worker	9.9800e-003	8.1900e-003	0.0861	2.2000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		21.9862	21.9862	6.9000e-004	7.1000e-004	22.2145
Total	**0.0155**	**0.2489**	**0.1425**	**1.0200e-003**	**0.0500**	**1.4700e-003**	**0.0514**	**0.0138**	**1.4000e-003**	**0.0152**		**107.3881**	**107.3881**	**2.3000e-003**	**0.0136**	**111.4890**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.22 Zayante Creek Crossing: Install flex connect - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1514	1.5357	2.2313	3.1200e-003		0.0758	0.0758		0.0698	0.0698	0.0000	301.5765	301.5765	0.0975		304.0149
Total	**0.1514**	**1.5357**	**2.2313**	**3.1200e-003**		**0.0758**	**0.0758**		**0.0698**	**0.0698**	**0.0000**	**301.5765**	**301.5765**	**0.0975**		**304.0149**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.4700e-003	0.2407	0.0564	8.0000e-004	0.0244	1.3100e-003	0.0257	7.0200e-003	1.2500e-003	8.2800e-003		85.4018	85.4018	1.6100e-003	0.0129	89.2745
Worker	9.9800e-003	8.1900e-003	0.0861	2.2000e-004	0.0256	1.6000e-004	0.0257	6.7700e-003	1.5000e-004	6.9200e-003		21.9862	21.9862	6.9000e-004	7.1000e-004	22.2145
Total	**0.0155**	**0.2489**	**0.1425**	**1.0200e-003**	**0.0500**	**1.4700e-003**	**0.0514**	**0.0138**	**1.4000e-003**	**0.0152**		**107.3881**	**107.3881**	**2.3000e-003**	**0.0136**	**111.4890**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.23 Zayante Creek Crossing: Grade for drainage - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1514	1.5357	2.2313	3.1200e-003		0.0758	0.0758		0.0698	0.0698		301.5765	301.5765	0.0975		304.0149
Total	**0.1514**	**1.5357**	**2.2313**	**3.1200e-003**	**0.0000**	**0.0758**	**0.0758**	**0.0000**	**0.0698**	**0.0698**		**301.5765**	**301.5765**	**0.0975**		**304.0149**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7300e-003	0.1204	0.0282	4.0000e-004	0.0122	6.6000e-004	0.0129	3.5100e-003	6.3000e-004	4.1400e-003		42.7009	42.7009	8.1000e-004	6.4300e-003	44.6373
Worker	0.0299	0.0246	0.2583	6.5000e-004	0.0766	4.8000e-004	0.0771	0.0203	4.4000e-004	0.0208		65.9587	65.9587	2.0600e-003	2.1300e-003	66.6436
Total	**0.0327**	**0.1449**	**0.2865**	**1.0500e-003**	**0.0889**	**1.1400e-003**	**0.0900**	**0.0238**	**1.0700e-003**	**0.0249**		**108.6596**	**108.6596**	**2.8700e-003**	**8.5600e-003**	**111.2808**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.23 Zayante Creek Crossing: Grade for drainage - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1514	1.5357	2.2313	3.1200e-003		0.0758	0.0758		0.0698	0.0698	0.0000	301.5765	301.5765	0.0975		304.0149
Total	**0.1514**	**1.5357**	**2.2313**	**3.1200e-003**	**0.0000**	**0.0758**	**0.0758**	**0.0000**	**0.0698**	**0.0698**	**0.0000**	**301.5765**	**301.5765**	**0.0975**		**304.0149**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7300e-003	0.1204	0.0282	4.0000e-004	0.0122	6.6000e-004	0.0129	3.5100e-003	6.3000e-004	4.1400e-003		42.7009	42.7009	8.1000e-004	6.4300e-003	44.6373
Worker	0.0299	0.0246	0.2583	6.5000e-004	0.0766	4.8000e-004	0.0771	0.0203	4.4000e-004	0.0208		65.9587	65.9587	2.0600e-003	2.1300e-003	66.6436
Total	**0.0327**	**0.1449**	**0.2865**	**1.0500e-003**	**0.0889**	**1.1400e-003**	**0.0900**	**0.0238**	**1.0700e-003**	**0.0249**		**108.6596**	**108.6596**	**2.8700e-003**	**8.5600e-003**	**111.2808**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.24 FBPS to Zayante: Road removal/pipe install - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0240	0.0000	0.0240	3.3600e-003	0.0000	3.3600e-003			0.0000			0.0000
Off-Road	0.2548	2.1147	3.6448	5.8700e-003		0.1013	0.1013		0.0951	0.0951		559.0095	559.0095	0.1548		562.8787
Total	**0.2548**	**2.1147**	**3.6448**	**5.8700e-003**	**0.0240**	**0.1013**	**0.1253**	**3.3600e-003**	**0.0951**	**0.0984**		**559.0095**	**559.0095**	**0.1548**		**562.8787**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1633	11.9414	1.7699	0.0372	0.9395	0.0775	1.0170	0.2569	0.0742	0.3310		4,052.7563	4,052.7563	0.1145	0.6421	4,246.9486
Vendor	0.0793	3.4905	0.8182	0.0115	0.3540	0.0190	0.3730	0.1018	0.0182	0.1200		1,238.3267	1,238.3267	0.0234	0.1865	1,294.4801
Worker	0.1597	0.1310	1.3777	3.4800e-003	0.4087	2.5400e-003	0.4113	0.1084	2.3400e-003	0.1107		351.7795	351.7795	0.0110	0.0113	355.4324
Total	**0.4023**	**15.5629**	**3.9658**	**0.0522**	**1.7022**	**0.0991**	**1.8013**	**0.4671**	**0.0947**	**0.5618**		**5,642.8625**	**5,642.8625**	**0.1489**	**0.8399**	**5,896.8611**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.24 FBPS to Zayante: Road removal/pipe install - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0108	0.0000	0.0108	1.5100e-003	0.0000	1.5100e-003			0.0000			0.0000
Off-Road	0.2548	2.1147	3.6448	5.8700e-003		0.1013	0.1013		0.0951	0.0951	0.0000	559.0095	559.0095	0.1548		562.8787
Total	**0.2548**	**2.1147**	**3.6448**	**5.8700e-003**	**0.0108**	**0.1013**	**0.1121**	**1.5100e-003**	**0.0951**	**0.0966**	**0.0000**	**559.0095**	**559.0095**	**0.1548**		**562.8787**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1633	11.9414	1.7699	0.0372	0.9395	0.0775	1.0170	0.2569	0.0742	0.3310		4,052.7563	4,052.7563	0.1145	0.6421	4,246.9486
Vendor	0.0793	3.4905	0.8182	0.0115	0.3540	0.0190	0.3730	0.1018	0.0182	0.1200		1,238.3267	1,238.3267	0.0234	0.1865	1,294.4801
Worker	0.1597	0.1310	1.3777	3.4800e-003	0.4087	2.5400e-003	0.4113	0.1084	2.3400e-003	0.1107		351.7795	351.7795	0.0110	0.0113	355.4324
Total	**0.4023**	**15.5629**	**3.9658**	**0.0522**	**1.7022**	**0.0991**	**1.8013**	**0.4671**	**0.0947**	**0.5618**		**5,642.8625**	**5,642.8625**	**0.1489**	**0.8399**	**5,896.8611**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.25 Zayante to Big Trees RR: Road removal/pipe install - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0385	0.0000	0.0385	5.3100e-003	0.0000	5.3100e-003			0.0000			0.0000
Off-Road	0.2548	2.1147	3.6448	5.8700e-003		0.1013	0.1013		0.0951	0.0951		559.0095	559.0095	0.1548		562.8787
Total	**0.2548**	**2.1147**	**3.6448**	**5.8700e-003**	**0.0385**	**0.1013**	**0.1398**	**5.3100e-003**	**0.0951**	**0.1004**		**559.0095**	**559.0095**	**0.1548**		**562.8787**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2451	17.9195	2.6560	0.0559	1.4098	0.1163	1.5262	0.3855	0.1113	0.4968		6,081.6300	6,081.6300	0.1718	0.9635	6,373.0381
Vendor	0.1162	5.1154	1.1991	0.0169	0.5188	0.0279	0.5466	0.1492	0.0267	0.1759		1,814.7891	1,814.7891	0.0342	0.2733	1,897.0829
Worker	0.1796	0.1474	1.5499	3.9100e-003	0.4598	2.8600e-003	0.4627	0.1219	2.6400e-003	0.1246		395.7520	395.7520	0.0124	0.0128	399.8614
Total	**0.5409**	**23.1823**	**5.4049**	**0.0767**	**2.3884**	**0.1471**	**2.5355**	**0.6566**	**0.1406**	**0.7972**		**8,292.1711**	**8,292.1711**	**0.2184**	**1.2495**	**8,669.9824**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.25 Zayante to Big Trees RR: Road removal/pipe install - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0173	0.0000	0.0173	2.3900e-003	0.0000	2.3900e-003			0.0000			0.0000
Off-Road	0.2548	2.1147	3.6448	5.8700e-003		0.1013	0.1013		0.0951	0.0951	0.0000	559.0095	559.0095	0.1548		562.8787
Total	**0.2548**	**2.1147**	**3.6448**	**5.8700e-003**	**0.0173**	**0.1013**	**0.1186**	**2.3900e-003**	**0.0951**	**0.0974**	**0.0000**	**559.0095**	**559.0095**	**0.1548**		**562.8787**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2451	17.9195	2.6560	0.0559	1.4098	0.1163	1.5262	0.3855	0.1113	0.4968		6,081.6300	6,081.6300	0.1718	0.9635	6,373.0381
Vendor	0.1162	5.1154	1.1991	0.0169	0.5188	0.0279	0.5466	0.1492	0.0267	0.1759		1,814.7891	1,814.7891	0.0342	0.2733	1,897.0829
Worker	0.1796	0.1474	1.5499	3.9100e-003	0.4598	2.8600e-003	0.4627	0.1219	2.6400e-003	0.1246		395.7520	395.7520	0.0124	0.0128	399.8614
Total	**0.5409**	**23.1823**	**5.4049**	**0.0767**	**2.3884**	**0.1471**	**2.5355**	**0.6566**	**0.1406**	**0.7972**		**8,292.1711**	**8,292.1711**	**0.2184**	**1.2495**	**8,669.9824**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.26 GH Rd North: Road removal/pipe install - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0892	0.0000	0.0892	0.0104	0.0000	0.0104			0.0000			0.0000
Off-Road	0.2439	1.9594	3.6510	5.8700e-003		0.0915	0.0915		0.0858	0.0858		559.2869	559.2869	0.1547		563.1551
Total	**0.2439**	**1.9594**	**3.6510**	**5.8700e-003**	**0.0892**	**0.0915**	**0.1806**	**0.0104**	**0.0858**	**0.0962**		**559.2869**	**559.2869**	**0.1547**		**563.1551**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1576	11.3981	1.7801	0.0364	0.9400	0.0749	1.0149	0.2570	0.0717	0.3287		3,969.9173	3,969.9173	0.1148	0.6290	4,160.2180
Vendor	0.1014	4.5476	1.0705	0.0152	0.4761	0.0248	0.5009	0.1370	0.0237	0.1606		1,636.7061	1,636.7061	0.0312	0.2464	1,710.9016
Worker	0.1593	0.1232	1.3474	3.5800e-003	0.4343	2.5400e-003	0.4368	0.1152	2.3500e-003	0.1175		362.2368	362.2368	0.0105	0.0111	365.8051
Total	**0.4182**	**16.0689**	**4.1980**	**0.0553**	**1.8503**	**0.1023**	**1.9526**	**0.5091**	**0.0978**	**0.6069**		**5,968.8602**	**5,968.8602**	**0.1565**	**0.8864**	**6,236.9247**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.26 GH Rd North: Road removal/pipe install - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0401	0.0000	0.0401	4.6800e-003	0.0000	4.6800e-003			0.0000			0.0000
Off-Road	0.2439	1.9594	3.6510	5.8700e-003		0.0915	0.0915		0.0858	0.0858	0.0000	559.2869	559.2869	0.1547		563.1551
Total	**0.2439**	**1.9594**	**3.6510**	**5.8700e-003**	**0.0401**	**0.0915**	**0.1316**	**4.6800e-003**	**0.0858**	**0.0905**	**0.0000**	**559.2869**	**559.2869**	**0.1547**		**563.1551**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1576	11.3981	1.7801	0.0364	0.9400	0.0749	1.0149	0.2570	0.0717	0.3287		3,969.9173	3,969.9173	0.1148	0.6290	4,160.2180
Vendor	0.1014	4.5476	1.0705	0.0152	0.4761	0.0248	0.5009	0.1370	0.0237	0.1606		1,636.7061	1,636.7061	0.0312	0.2464	1,710.9016
Worker	0.1593	0.1232	1.3474	3.5800e-003	0.4343	2.5400e-003	0.4368	0.1152	2.3500e-003	0.1175		362.2368	362.2368	0.0105	0.0111	365.8051
Total	**0.4182**	**16.0689**	**4.1980**	**0.0553**	**1.8503**	**0.1023**	**1.9526**	**0.5091**	**0.0978**	**0.6069**		**5,968.8602**	**5,968.8602**	**0.1565**	**0.8864**	**6,236.9247**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.27 FBPS to Zayante: Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252		1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	28.0340					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**28.5826**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**		**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1309	9.4718	1.4793	0.0303	0.7811	0.0623	0.8434	0.2136	0.0596	0.2732		3,299.0079	3,299.0079	0.0954	0.5227	3,457.1481
Vendor	0.0650	2.9151	0.6862	9.7700e-003	0.3052	0.0159	0.3211	0.0878	0.0152	0.1030		1,049.1706	1,049.1706	0.0200	0.1579	1,096.7318
Worker	0.1031	0.0797	0.8719	2.3200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		234.3885	234.3885	6.8000e-003	7.1800e-003	236.6974
Total	**0.2990**	**12.4667**	**3.0373**	**0.0424**	**1.3673**	**0.0798**	**1.4471**	**0.3759**	**0.0763**	**0.4522**		**4,582.5670**	**4,582.5670**	**0.1222**	**0.6878**	**4,790.5774**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.27 FBPS to Zayante: Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252	0.0000	1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	28.0340					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**28.5826**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**	**0.0000**	**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1309	9.4718	1.4793	0.0303	0.7811	0.0623	0.8434	0.2136	0.0596	0.2732		3,299.0079	3,299.0079	0.0954	0.5227	3,457.1481
Vendor	0.0650	2.9151	0.6862	9.7700e-003	0.3052	0.0159	0.3211	0.0878	0.0152	0.1030		1,049.1706	1,049.1706	0.0200	0.1579	1,096.7318
Worker	0.1031	0.0797	0.8719	2.3200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		234.3885	234.3885	6.8000e-003	7.1800e-003	236.6974
Total	**0.2990**	**12.4667**	**3.0373**	**0.0424**	**1.3673**	**0.0798**	**1.4471**	**0.3759**	**0.0763**	**0.4522**		**4,582.5670**	**4,582.5670**	**0.1222**	**0.6878**	**4,790.5774**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.28 Zayante to Big Trees RR: Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252		1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	28.0340					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**28.5826**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**		**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1950	14.1025	2.2025	0.0451	1.1630	0.0927	1.2557	0.3180	0.0887	0.4067		4,911.8562	4,911.8562	0.1420	0.7782	5,147.3094
Vendor	0.0936	4.1978	0.9881	0.0141	0.4395	0.0229	0.4623	0.1264	0.0219	0.1483		1,510.8057	1,510.8057	0.0288	0.2274	1,579.2938
Worker	0.1031	0.0797	0.8719	2.3200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		234.3885	234.3885	6.8000e-003	7.1800e-003	236.6974
Total	**0.3916**	**18.3800**	**4.0625**	**0.0615**	**1.8834**	**0.1172**	**2.0007**	**0.5189**	**0.1121**	**0.6310**		**6,657.0504**	**6,657.0504**	**0.1776**	**1.0128**	**6,963.3006**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.28 Zayante to Big Trees RR: Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252	0.0000	1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	28.0340					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**28.5826**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**	**0.0000**	**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1950	14.1025	2.2025	0.0451	1.1630	0.0927	1.2557	0.3180	0.0887	0.4067		4,911.8562	4,911.8562	0.1420	0.7782	5,147.3094
Vendor	0.0936	4.1978	0.9881	0.0141	0.4395	0.0229	0.4623	0.1264	0.0219	0.1483		1,510.8057	1,510.8057	0.0288	0.2274	1,579.2938
Worker	0.1031	0.0797	0.8719	2.3200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		234.3885	234.3885	6.8000e-003	7.1800e-003	236.6974
Total	**0.3916**	**18.3800**	**4.0625**	**0.0615**	**1.8834**	**0.1172**	**2.0007**	**0.5189**	**0.1121**	**0.6310**		**6,657.0504**	**6,657.0504**	**0.1776**	**1.0128**	**6,963.3006**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.29 GH Rd North: Pressure test - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3059	2.5785	3.7198	6.5800e-003		0.1173	0.1173		0.1173	0.1173		623.0346	623.0346	0.0274		623.7198
Total	**0.3059**	**2.5785**	**3.7198**	**6.5800e-003**		**0.1173**	**0.1173**		**0.1173**	**0.1173**		**623.0346**	**623.0346**	**0.0274**		**623.7198**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.2000e-003	0.2332	0.0549	7.8000e-004	0.0244	1.2700e-003	0.0257	7.0200e-003	1.2200e-003	8.2400e-003		83.9337	83.9337	1.6000e-003	0.0126	87.7385
Worker	0.0187	0.0145	0.1585	4.2000e-004	0.0511	3.0000e-004	0.0514	0.0136	2.8000e-004	0.0138		42.6161	42.6161	1.2400e-003	1.3100e-003	43.0359
Total	**0.0239**	**0.2477**	**0.2134**	**1.2000e-003**	**0.0755**	**1.5700e-003**	**0.0771**	**0.0206**	**1.5000e-003**	**0.0221**		**126.5497**	**126.5497**	**2.8400e-003**	**0.0139**	**130.7744**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.29 GH Rd North: Pressure test - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3059	2.5785	3.7198	6.5800e-003		0.1173	0.1173		0.1173	0.1173	0.0000	623.0346	623.0346	0.0274		623.7198
Total	**0.3059**	**2.5785**	**3.7198**	**6.5800e-003**		**0.1173**	**0.1173**		**0.1173**	**0.1173**	**0.0000**	**623.0346**	**623.0346**	**0.0274**		**623.7198**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.2000e-003	0.2332	0.0549	7.8000e-004	0.0244	1.2700e-003	0.0257	7.0200e-003	1.2200e-003	8.2400e-003		83.9337	83.9337	1.6000e-003	0.0126	87.7385
Worker	0.0187	0.0145	0.1585	4.2000e-004	0.0511	3.0000e-004	0.0514	0.0136	2.8000e-004	0.0138		42.6161	42.6161	1.2400e-003	1.3100e-003	43.0359
Total	**0.0239**	**0.2477**	**0.2134**	**1.2000e-003**	**0.0755**	**1.5700e-003**	**0.0771**	**0.0206**	**1.5000e-003**	**0.0221**		**126.5497**	**126.5497**	**2.8400e-003**	**0.0139**	**130.7744**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.30 GH Rd North: Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252		1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	2.8034					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**3.3520**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**		**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1307	9.4508	1.4760	0.0302	0.7794	0.0621	0.8415	0.2131	0.0595	0.2726		3,291.6768	3,291.6768	0.0952	0.5215	3,449.4656
Vendor	0.0650	2.9151	0.6862	9.7700e-003	0.3052	0.0159	0.3211	0.0878	0.0152	0.1030		1,049.1706	1,049.1706	0.0200	0.1579	1,096.7318
Worker	0.1031	0.0797	0.8719	2.3200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		234.3885	234.3885	6.8000e-003	7.1800e-003	236.6974
Total	**0.2987**	**12.4456**	**3.0340**	**0.0423**	**1.3656**	**0.0797**	**1.4452**	**0.3754**	**0.0762**	**0.4516**		**4,575.2359**	**4,575.2359**	**0.1220**	**0.6866**	**4,782.8948**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.30 GH Rd North: Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252	0.0000	1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	2.8034					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**3.3520**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**	**0.0000**	**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1307	9.4508	1.4760	0.0302	0.7794	0.0621	0.8415	0.2131	0.0595	0.2726		3,291.6768	3,291.6768	0.0952	0.5215	3,449.4656
Vendor	0.0650	2.9151	0.6862	9.7700e-003	0.3052	0.0159	0.3211	0.0878	0.0152	0.1030		1,049.1706	1,049.1706	0.0200	0.1579	1,096.7318
Worker	0.1031	0.0797	0.8719	2.3200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		234.3885	234.3885	6.8000e-003	7.1800e-003	236.6974
Total	**0.2987**	**12.4456**	**3.0340**	**0.0423**	**1.3656**	**0.0797**	**1.4452**	**0.3754**	**0.0762**	**0.4516**		**4,575.2359**	**4,575.2359**	**0.1220**	**0.6866**	**4,782.8948**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.31 GH Rd South: Road removal/pipe install - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0595	0.0000	0.0595	7.9600e-003	0.0000	7.9600e-003			0.0000			0.0000
Off-Road	0.2439	1.9594	3.6510	5.8700e-003		0.0915	0.0915		0.0858	0.0858		559.2869	559.2869	0.1547		563.1551
Total	**0.2439**	**1.9594**	**3.6510**	**5.8700e-003**	**0.0595**	**0.0915**	**0.1510**	**7.9600e-003**	**0.0858**	**0.0938**		**559.2869**	**559.2869**	**0.1547**		**563.1551**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3151	22.7956	3.5601	0.0729	1.8798	0.1499	2.0297	0.5140	0.1434	0.6574		7,939.6124	7,939.6124	0.2296	1.2579	8,320.2031
Vendor	0.1456	6.5299	1.5371	0.0219	0.6836	0.0356	0.7192	0.1967	0.0340	0.2307		2,350.1421	2,350.1421	0.0448	0.3538	2,456.6792
Worker	0.1593	0.1232	1.3474	3.5800e-003	0.4343	2.5400e-003	0.4368	0.1152	2.3500e-003	0.1175		362.2368	362.2368	0.0105	0.0111	365.8051
Total	**0.6200**	**29.4486**	**6.4446**	**0.0983**	**2.9977**	**0.1880**	**3.1857**	**0.8258**	**0.1798**	**1.0056**		**10,651.9913**	**10,651.9913**	**0.2848**	**1.6227**	**11,142.6875**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.31 GH Rd South: Road removal/pipe install - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0268	0.0000	0.0268	3.5800e-003	0.0000	3.5800e-003			0.0000			0.0000
Off-Road	0.2439	1.9594	3.6510	5.8700e-003		0.0915	0.0915		0.0858	0.0858	0.0000	559.2869	559.2869	0.1547		563.1551
Total	**0.2439**	**1.9594**	**3.6510**	**5.8700e-003**	**0.0268**	**0.0915**	**0.1182**	**3.5800e-003**	**0.0858**	**0.0894**	**0.0000**	**559.2869**	**559.2869**	**0.1547**		**563.1551**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3151	22.7956	3.5601	0.0729	1.8798	0.1499	2.0297	0.5140	0.1434	0.6574		7,939.6124	7,939.6124	0.2296	1.2579	8,320.2031
Vendor	0.1456	6.5299	1.5371	0.0219	0.6836	0.0356	0.7192	0.1967	0.0340	0.2307		2,350.1421	2,350.1421	0.0448	0.3538	2,456.6792
Worker	0.1593	0.1232	1.3474	3.5800e-003	0.4343	2.5400e-003	0.4368	0.1152	2.3500e-003	0.1175		362.2368	362.2368	0.0105	0.0111	365.8051
Total	**0.6200**	**29.4486**	**6.4446**	**0.0983**	**2.9977**	**0.1880**	**3.1857**	**0.8258**	**0.1798**	**1.0056**		**10,651.9913**	**10,651.9913**	**0.2848**	**1.6227**	**11,142.6875**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.32 GH Rd North: Tie in to FBPS - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6000e-003	0.1166	0.0275	3.9000e-004	0.0122	6.4000e-004	0.0128	3.5100e-003	6.1000e-004	4.1200e-003		41.9668	41.9668	8.0000e-004	6.3200e-003	43.8693
Worker	9.3700e-003	7.2400e-003	0.0793	2.1000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		21.3081	21.3081	6.2000e-004	6.5000e-004	21.5180
Total	**0.0120**	**0.1239**	**0.1067**	**6.0000e-004**	**0.0378**	**7.9000e-004**	**0.0385**	**0.0103**	**7.5000e-004**	**0.0110**		**63.2749**	**63.2749**	**1.4200e-003**	**6.9700e-003**	**65.3872**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.32 GH Rd North: Tie in to FBPS - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6000e-003	0.1166	0.0275	3.9000e-004	0.0122	6.4000e-004	0.0128	3.5100e-003	6.1000e-004	4.1200e-003		41.9668	41.9668	8.0000e-004	6.3200e-003	43.8693
Worker	9.3700e-003	7.2400e-003	0.0793	2.1000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		21.3081	21.3081	6.2000e-004	6.5000e-004	21.5180
Total	**0.0120**	**0.1239**	**0.1067**	**6.0000e-004**	**0.0378**	**7.9000e-004**	**0.0385**	**0.0103**	**7.5000e-004**	**0.0110**		**63.2749**	**63.2749**	**1.4200e-003**	**6.9700e-003**	**65.3872**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.33 GH Rd South: Test pipeline - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3059	2.5785	3.7198	6.5800e-003		0.1173	0.1173		0.1173	0.1173		623.0346	623.0346	0.0274		623.7198
Total	**0.3059**	**2.5785**	**3.7198**	**6.5800e-003**		**0.1173**	**0.1173**		**0.1173**	**0.1173**		**623.0346**	**623.0346**	**0.0274**		**623.7198**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.2000e-003	0.2332	0.0549	7.8000e-004	0.0244	1.2700e-003	0.0257	7.0200e-003	1.2200e-003	8.2400e-003		83.9337	83.9337	1.6000e-003	0.0126	87.7385
Worker	0.0187	0.0145	0.1585	4.2000e-004	0.0511	3.0000e-004	0.0514	0.0136	2.8000e-004	0.0138		42.6161	42.6161	1.2400e-003	1.3100e-003	43.0359
Total	**0.0239**	**0.2477**	**0.2134**	**1.2000e-003**	**0.0755**	**1.5700e-003**	**0.0771**	**0.0206**	**1.5000e-003**	**0.0221**		**126.5497**	**126.5497**	**2.8400e-003**	**0.0139**	**130.7744**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.33 GH Rd South: Test pipeline - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3059	2.5785	3.7198	6.5800e-003		0.1173	0.1173		0.1173	0.1173	0.0000	623.0346	623.0346	0.0274		623.7198
Total	**0.3059**	**2.5785**	**3.7198**	**6.5800e-003**		**0.1173**	**0.1173**		**0.1173**	**0.1173**	**0.0000**	**623.0346**	**623.0346**	**0.0274**		**623.7198**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.2000e-003	0.2332	0.0549	7.8000e-004	0.0244	1.2700e-003	0.0257	7.0200e-003	1.2200e-003	8.2400e-003		83.9337	83.9337	1.6000e-003	0.0126	87.7385
Worker	0.0187	0.0145	0.1585	4.2000e-004	0.0511	3.0000e-004	0.0514	0.0136	2.8000e-004	0.0138		42.6161	42.6161	1.2400e-003	1.3100e-003	43.0359
Total	**0.0239**	**0.2477**	**0.2134**	**1.2000e-003**	**0.0755**	**1.5700e-003**	**0.0771**	**0.0206**	**1.5000e-003**	**0.0221**		**126.5497**	**126.5497**	**2.8400e-003**	**0.0139**	**130.7744**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.34 GH Rd South: Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252		1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	5.6068					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**6.1554**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**		**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2613	18.9016	2.9520	0.0604	1.5587	0.1243	1.6830	0.4262	0.1189	0.5451		6,583.3536	6,583.3536	0.1903	1.0430	6,898.9311
Vendor	0.1209	5.4222	1.2763	0.0182	0.5676	0.0295	0.5972	0.1633	0.0283	0.1915		1,951.4573	1,951.4573	0.0372	0.2937	2,039.9212
Worker	0.1031	0.0797	0.8719	2.3200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		234.3885	234.3885	6.8000e-003	7.1800e-003	236.6974
Total	**0.4853**	**24.4034**	**5.1002**	**0.0809**	**2.4074**	**0.1555**	**2.5628**	**0.6640**	**0.1487**	**0.8127**		**8,769.1994**	**8,769.1994**	**0.2343**	**1.3439**	**9,175.5497**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.34 GH Rd South: Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5486	5.0236	8.1857	0.0128		0.2433	0.2433		0.2252	0.2252	0.0000	1,227.3786	1,227.3786	0.3840		1,236.9785
Paving	5.6068					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**6.1554**	**5.0236**	**8.1857**	**0.0128**		**0.2433**	**0.2433**		**0.2252**	**0.2252**	**0.0000**	**1,227.3786**	**1,227.3786**	**0.3840**		**1,236.9785**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2613	18.9016	2.9520	0.0604	1.5587	0.1243	1.6830	0.4262	0.1189	0.5451		6,583.3536	6,583.3536	0.1903	1.0430	6,898.9311
Vendor	0.1209	5.4222	1.2763	0.0182	0.5676	0.0295	0.5972	0.1633	0.0283	0.1915		1,951.4573	1,951.4573	0.0372	0.2937	2,039.9212
Worker	0.1031	0.0797	0.8719	2.3200e-003	0.2810	1.6500e-003	0.2827	0.0745	1.5200e-003	0.0760		234.3885	234.3885	6.8000e-003	7.1800e-003	236.6974
Total	**0.4853**	**24.4034**	**5.1002**	**0.0809**	**2.4074**	**0.1555**	**2.5628**	**0.6640**	**0.1487**	**0.8127**		**8,769.1994**	**8,769.1994**	**0.2343**	**1.3439**	**9,175.5497**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.35 GH Rd South: GHWTP tie in - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1439	1.4483	2.2356	3.1200e-003		0.0665	0.0665		0.0612	0.0612		301.7667	301.7667	0.0976		304.2067
Total	**0.1439**	**1.4483**	**2.2356**	**3.1200e-003**		**0.0665**	**0.0665**		**0.0612**	**0.0612**		**301.7667**	**301.7667**	**0.0976**		**304.2067**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6000e-003	0.1166	0.0275	3.9000e-004	0.0122	6.4000e-004	0.0128	3.5100e-003	6.1000e-004	4.1200e-003		41.9668	41.9668	8.0000e-004	6.3200e-003	43.8693
Worker	9.3700e-003	7.2400e-003	0.0793	2.1000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		21.3081	21.3081	6.2000e-004	6.5000e-004	21.5180
Total	**0.0120**	**0.1239**	**0.1067**	**6.0000e-004**	**0.0378**	**7.9000e-004**	**0.0385**	**0.0103**	**7.5000e-004**	**0.0110**		**63.2749**	**63.2749**	**1.4200e-003**	**6.9700e-003**	**65.3872**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.35 GH Rd South: GHWTP tie in - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1439	1.4483	2.2356	3.1200e-003		0.0665	0.0665		0.0612	0.0612	0.0000	301.7667	301.7667	0.0976		304.2067
Total	**0.1439**	**1.4483**	**2.2356**	**3.1200e-003**		**0.0665**	**0.0665**		**0.0612**	**0.0612**	**0.0000**	**301.7667**	**301.7667**	**0.0976**		**304.2067**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6000e-003	0.1166	0.0275	3.9000e-004	0.0122	6.4000e-004	0.0128	3.5100e-003	6.1000e-004	4.1200e-003		41.9668	41.9668	8.0000e-004	6.3200e-003	43.8693
Worker	9.3700e-003	7.2400e-003	0.0793	2.1000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		21.3081	21.3081	6.2000e-004	6.5000e-004	21.5180
Total	**0.0120**	**0.1239**	**0.1067**	**6.0000e-004**	**0.0378**	**7.9000e-004**	**0.0385**	**0.0103**	**7.5000e-004**	**0.0110**		**63.2749**	**63.2749**	**1.4200e-003**	**6.9700e-003**	**65.3872**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.36 GH Rd South: Pavement striping - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	38.8867					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1861	2.0563	1.6249	6.7600e-003		0.0778	0.0778		0.0716	0.0716		654.3830	654.3830	0.2116		659.6740
Total	**39.0729**	**2.0563**	**1.6249**	**6.7600e-003**		**0.0778**	**0.0778**		**0.0716**	**0.0716**		**654.3830**	**654.3830**	**0.2116**		**659.6740**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6000e-003	0.1166	0.0275	3.9000e-004	0.0122	6.4000e-004	0.0128	3.5100e-003	6.1000e-004	4.1200e-003		41.9668	41.9668	8.0000e-004	6.3200e-003	43.8693
Worker	9.3700e-003	7.2400e-003	0.0793	2.1000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		21.3081	21.3081	6.2000e-004	6.5000e-004	21.5180
Total	**0.0120**	**0.1239**	**0.1067**	**6.0000e-004**	**0.0378**	**7.9000e-004**	**0.0385**	**0.0103**	**7.5000e-004**	**0.0110**		**63.2749**	**63.2749**	**1.4200e-003**	**6.9700e-003**	**65.3872**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.36 GH Rd South: Pavement striping - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	38.8867					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1861	2.0563	1.6249	6.7600e-003		0.0778	0.0778		0.0716	0.0716	0.0000	654.3830	654.3830	0.2116		659.6740
Total	**39.0729**	**2.0563**	**1.6249**	**6.7600e-003**		**0.0778**	**0.0778**		**0.0716**	**0.0716**	**0.0000**	**654.3830**	**654.3830**	**0.2116**		**659.6740**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6000e-003	0.1166	0.0275	3.9000e-004	0.0122	6.4000e-004	0.0128	3.5100e-003	6.1000e-004	4.1200e-003		41.9668	41.9668	8.0000e-004	6.3200e-003	43.8693
Worker	9.3700e-003	7.2400e-003	0.0793	2.1000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		21.3081	21.3081	6.2000e-004	6.5000e-004	21.5180
Total	**0.0120**	**0.1239**	**0.1067**	**6.0000e-004**	**0.0378**	**7.9000e-004**	**0.0385**	**0.0103**	**7.5000e-004**	**0.0110**		**63.2749**	**63.2749**	**1.4200e-003**	**6.9700e-003**	**65.3872**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.37 GH Rd South: Cathodic protection - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1861	2.0563	1.6249	6.7600e-003		0.0778	0.0778		0.0716	0.0716		654.3830	654.3830	0.2116		659.6740
Total	**0.1861**	**2.0563**	**1.6249**	**6.7600e-003**		**0.0778**	**0.0778**		**0.0716**	**0.0716**		**654.3830**	**654.3830**	**0.2116**		**659.6740**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6000e-003	0.1166	0.0275	3.9000e-004	0.0122	6.4000e-004	0.0128	3.5100e-003	6.1000e-004	4.1200e-003		41.9668	41.9668	8.0000e-004	6.3200e-003	43.8693
Worker	9.3700e-003	7.2400e-003	0.0793	2.1000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		21.3081	21.3081	6.2000e-004	6.5000e-004	21.5180
Total	**0.0120**	**0.1239**	**0.1067**	**6.0000e-004**	**0.0378**	**7.9000e-004**	**0.0385**	**0.0103**	**7.5000e-004**	**0.0110**		**63.2749**	**63.2749**	**1.4200e-003**	**6.9700e-003**	**65.3872**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.37 GH Rd South: Cathodic protection - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1861	2.0563	1.6249	6.7600e-003		0.0778	0.0778		0.0716	0.0716	0.0000	654.3830	654.3830	0.2116		659.6740
Total	**0.1861**	**2.0563**	**1.6249**	**6.7600e-003**		**0.0778**	**0.0778**		**0.0716**	**0.0716**	**0.0000**	**654.3830**	**654.3830**	**0.2116**		**659.6740**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6000e-003	0.1166	0.0275	3.9000e-004	0.0122	6.4000e-004	0.0128	3.5100e-003	6.1000e-004	4.1200e-003		41.9668	41.9668	8.0000e-004	6.3200e-003	43.8693
Worker	9.3700e-003	7.2400e-003	0.0793	2.1000e-004	0.0256	1.5000e-004	0.0257	6.7700e-003	1.4000e-004	6.9100e-003		21.3081	21.3081	6.2000e-004	6.5000e-004	21.5180
Total	**0.0120**	**0.1239**	**0.1067**	**6.0000e-004**	**0.0378**	**7.9000e-004**	**0.0385**	**0.0103**	**7.5000e-004**	**0.0110**		**63.2749**	**63.2749**	**1.4200e-003**	**6.9700e-003**	**65.3872**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.38 Abandon Existing NCP: Outside Henry Cowell - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1282	0.8757	0.7231	1.5800e-003		0.0345	0.0345		0.0339	0.0339		130.2339	130.2339	0.0220		130.7843
Total	**0.1282**	**0.8757**	**0.7231**	**1.5800e-003**		**0.0345**	**0.0345**		**0.0339**	**0.0339**		**130.2339**	**130.2339**	**0.0220**		**130.7843**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0336	2.4276	0.3791	7.7600e-003	0.2002	0.0160	0.2162	0.0547	0.0153	0.0700		845.5235	845.5235	0.0245	0.1340	886.0543
Vendor	0.0182	0.8162	0.1921	2.7400e-003	0.0855	4.4500e-003	0.0899	0.0246	4.2500e-003	0.0288		293.7678	293.7678	5.5900e-003	0.0442	307.0849
Worker	0.0281	0.0217	0.2378	6.3000e-004	0.0766	4.5000e-004	0.0771	0.0203	4.1000e-004	0.0207		63.9241	63.9241	1.8500e-003	1.9600e-003	64.5538
Total	**0.0799**	**3.2656**	**0.8090**	**0.0111**	**0.3623**	**0.0209**	**0.3831**	**0.0996**	**0.0199**	**0.1196**		**1,203.2154**	**1,203.2154**	**0.0319**	**0.1801**	**1,257.6930**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.38 Abandon Existing NCP: Outside Henry Cowell - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1282	0.8757	0.7231	1.5800e-003		0.0345	0.0345		0.0339	0.0339	0.0000	130.2339	130.2339	0.0220		130.7843
Total	**0.1282**	**0.8757**	**0.7231**	**1.5800e-003**		**0.0345**	**0.0345**		**0.0339**	**0.0339**	**0.0000**	**130.2339**	**130.2339**	**0.0220**		**130.7843**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0336	2.4276	0.3791	7.7600e-003	0.2002	0.0160	0.2162	0.0547	0.0153	0.0700		845.5235	845.5235	0.0245	0.1340	886.0543
Vendor	0.0182	0.8162	0.1921	2.7400e-003	0.0855	4.4500e-003	0.0899	0.0246	4.2500e-003	0.0288		293.7678	293.7678	5.5900e-003	0.0442	307.0849
Worker	0.0281	0.0217	0.2378	6.3000e-004	0.0766	4.5000e-004	0.0771	0.0203	4.1000e-004	0.0207		63.9241	63.9241	1.8500e-003	1.9600e-003	64.5538
Total	**0.0799**	**3.2656**	**0.8090**	**0.0111**	**0.3623**	**0.0209**	**0.3831**	**0.0996**	**0.0199**	**0.1196**		**1,203.2154**	**1,203.2154**	**0.0319**	**0.1801**	**1,257.6930**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.38 Abandon Existing NCP: Outside Henry Cowell - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1267	0.8615	0.7223	1.5900e-003		0.0330	0.0330		0.0324	0.0324		130.2700	130.2700	0.0220		130.8208
Total	**0.1267**	**0.8615**	**0.7223**	**1.5900e-003**		**0.0330**	**0.0330**		**0.0324**	**0.0324**		**130.2700**	**130.2700**	**0.0220**		**130.8208**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0322	2.3115	0.3802	7.5800e-003	0.2002	0.0153	0.2155	0.0548	0.0147	0.0694		826.6988	826.6988	0.0245	0.1310	866.3433
Vendor	0.0173	0.7896	0.1878	2.6800e-003	0.0855	4.2800e-003	0.0897	0.0246	4.0900e-003	0.0287		288.3300	288.3300	5.5500e-003	0.0434	301.3956
Worker	0.0265	0.0194	0.2201	6.1000e-004	0.0766	4.3000e-004	0.0771	0.0203	3.9000e-004	0.0207		61.8820	61.8820	1.6700e-003	1.8100e-003	62.4644
Total	**0.0761**	**3.1204**	**0.7881**	**0.0109**	**0.3623**	**0.0200**	**0.3823**	**0.0997**	**0.0191**	**0.1188**		**1,176.9108**	**1,176.9108**	**0.0317**	**0.1762**	**1,230.2032**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.38 Abandon Existing NCP: Outside Henry Cowell - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1267	0.8615	0.7223	1.5900e-003		0.0330	0.0330		0.0324	0.0324	0.0000	130.2700	130.2700	0.0220		130.8208
Total	**0.1267**	**0.8615**	**0.7223**	**1.5900e-003**		**0.0330**	**0.0330**		**0.0324**	**0.0324**	**0.0000**	**130.2700**	**130.2700**	**0.0220**		**130.8208**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0322	2.3115	0.3802	7.5800e-003	0.2002	0.0153	0.2155	0.0548	0.0147	0.0694		826.6988	826.6988	0.0245	0.1310	866.3433
Vendor	0.0173	0.7896	0.1878	2.6800e-003	0.0855	4.2800e-003	0.0897	0.0246	4.0900e-003	0.0287		288.3300	288.3300	5.5500e-003	0.0434	301.3956
Worker	0.0265	0.0194	0.2201	6.1000e-004	0.0766	4.3000e-004	0.0771	0.0203	3.9000e-004	0.0207		61.8820	61.8820	1.6700e-003	1.8100e-003	62.4644
Total	**0.0761**	**3.1204**	**0.7881**	**0.0109**	**0.3623**	**0.0200**	**0.3823**	**0.0997**	**0.0191**	**0.1188**		**1,176.9108**	**1,176.9108**	**0.0317**	**0.1762**	**1,230.2032**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.39 Abandon Existing NCP: Inside Henry Cowell - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1267	0.8615	0.7223	1.5900e-003		0.0330	0.0330		0.0324	0.0324		130.2700	130.2700	0.0220		130.8208
Total	**0.1267**	**0.8615**	**0.7223**	**1.5900e-003**		**0.0330**	**0.0330**		**0.0324**	**0.0324**		**130.2700**	**130.2700**	**0.0220**		**130.8208**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0323	2.3134	0.3805	7.5900e-003	0.2004	0.0153	0.2157	0.0548	0.0147	0.0695		827.3814	827.3814	0.0245	0.1311	867.0587
Vendor	0.0173	0.7896	0.1878	2.6800e-003	0.0855	4.2800e-003	0.0897	0.0246	4.0900e-003	0.0287		288.3300	288.3300	5.5500e-003	0.0434	301.3956
Worker	0.0265	0.0194	0.2201	6.1000e-004	0.0766	4.3000e-004	0.0771	0.0203	3.9000e-004	0.0207		61.8820	61.8820	1.6700e-003	1.8100e-003	62.4644
Total	**0.0761**	**3.1223**	**0.7884**	**0.0109**	**0.3625**	**0.0200**	**0.3825**	**0.0997**	**0.0191**	**0.1188**		**1,177.5935**	**1,177.5935**	**0.0317**	**0.1763**	**1,230.9186**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.39 Abandon Existing NCP: Inside Henry Cowell - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.1267	0.8615	0.7223	1.5900e-003		0.0330	0.0330		0.0324	0.0324	0.0000	130.2700	130.2700	0.0220		130.8208
Total	**0.1267**	**0.8615**	**0.7223**	**1.5900e-003**		**0.0330**	**0.0330**		**0.0324**	**0.0324**	**0.0000**	**130.2700**	**130.2700**	**0.0220**		**130.8208**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0323	2.3134	0.3805	7.5900e-003	0.2004	0.0153	0.2157	0.0548	0.0147	0.0695		827.3814	827.3814	0.0245	0.1311	867.0587
Vendor	0.0173	0.7896	0.1878	2.6800e-003	0.0855	4.2800e-003	0.0897	0.0246	4.0900e-003	0.0287		288.3300	288.3300	5.5500e-003	0.0434	301.3956
Worker	0.0265	0.0194	0.2201	6.1000e-004	0.0766	4.3000e-004	0.0771	0.0203	3.9000e-004	0.0207		61.8820	61.8820	1.6700e-003	1.8100e-003	62.4644
Total	**0.0761**	**3.1223**	**0.7884**	**0.0109**	**0.3625**	**0.0200**	**0.3825**	**0.0997**	**0.0191**	**0.1188**		**1,177.5935**	**1,177.5935**	**0.0317**	**0.1763**	**1,230.9186**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.552058	0.056962	0.193821	0.123008	0.021404	0.005318	0.010231	0.003525	0.000574	0.000778	0.028458	0.000952	0.002912

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1652	1.0000e-005	1.0900e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.3400e-003	2.3400e-003	1.0000e-005		2.4900e-003
Unmitigated	0.1652	1.0000e-005	1.0900e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.3400e-003	2.3400e-003	1.0000e-005		2.4900e-003

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1651					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-004	1.0000e-005	1.0900e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.3400e-003	2.3400e-003	1.0000e-005		2.4900e-003
Total	**0.1652**	**1.0000e-005**	**1.0900e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.3400e-003**	**2.3400e-003**	**1.0000e-005**		**2.4900e-003**

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1651					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-004	1.0000e-005	1.0900e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.3400e-003	2.3400e-003	1.0000e-005		2.4900e-003
Total	**0.1652**	**1.0000e-005**	**1.0900e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.3400e-003**	**2.3400e-003**	**1.0000e-005**		**2.4900e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Newell Creek Pipeline Construction - Near Term

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	10.70	Acre	10.70	466,092.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	1.8	**Precipitation Freq (Days)**	61
Climate Zone	5			**Operational Year**	2032
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Area to be paved conservatively based on total length (linear feet) of pipelines by 20 feet width (near term construction)

Construction Phase - Schedule based on SCWD input

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment -

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Trips and VMT - Based on input from SCWD

Grading - Based on input from SCWD

Architectural Coating - Default

Vehicle Trips - Modeling construction only

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Newell Creek Pipeline Construction - Near Term - Santa Cruz County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on input from SCWD

On-road Fugitive Dust - Default

Area Coating - Modeling construction only

Construction Off-road Equipment Mitigation - Water exposed areas 2x per day

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	300.00	15.00
tblConstructionPhase	NumDays	300.00	10.00
tblConstructionPhase	NumDays	300.00	15.00
tblConstructionPhase	NumDays	300.00	15.00
tblConstructionPhase	NumDays	300.00	5.00
tblConstructionPhase	NumDays	30.00	5.00
tblConstructionPhase	NumDays	30.00	15.00
tblConstructionPhase	NumDays	30.00	132.00
tblConstructionPhase	NumDays	30.00	60.00
tblConstructionPhase	NumDays	30.00	40.00
tblConstructionPhase	NumDays	20.00	1.00
tblConstructionPhase	NumDays	20.00	1.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	10.00	25.00
tblConstructionPhase	NumDays	10.00	20.00
tblConstructionPhase	NumDays	10.00	25.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstructionPhase	NumDays	10.00	34.00
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tblConstructionPhase	NumDays	30.00	59.00
tblConstructionPhase	NumDays	30.00	59.00
tblGrading	AcresOfGrading	0.00	0.09
tblGrading	AcresOfGrading	0.00	0.34
tblGrading	AcresOfGrading	0.00	8.90
tblGrading	AcresOfGrading	0.00	1.37
tblGrading	MaterialExported	0.00	3,038.00
tblGrading	MaterialExported	0.00	9,113.00
tblGrading	MaterialExported	0.00	26,730.00
tblGrading	MaterialExported	0.00	24,300.00
tblGrading	MaterialExported	0.00	849.00
tblGrading	MaterialExported	0.00	849.00
tblGrading	MaterialExported	0.00	233.00
tblOffRoadEquipment	HorsePower	130.00	75.00
tblOffRoadEquipment	HorsePower	130.00	75.00
tblOffRoadEquipment	HorsePower	130.00	75.00
tblOffRoadEquipment	HorsePower	130.00	75.00
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tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	65.00	80.00
tblOffRoadEquipment	HorsePower	65.00	80.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	HorsePower	65.00	80.00
tblOffRoadEquipment	HorsePower	65.00	80.00
tblOffRoadEquipment	HorsePower	97.00	170.00
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tblOffRoadEquipment	HorsePower	97.00	170.00
tblOffRoadEquipment	HorsePower	97.00	170.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	PhaseName		Big Trees RR Crossing: Backfill
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Tie in to FBPS
tblOffRoadEquipment	PhaseName		Big Trees RR Crossing: Boring and casing
tblOffRoadEquipment	PhaseName		Zayante Creek Crossing: CIDH Piles
tblOffRoadEquipment	PhaseName		Big Trees RR Crossing: Grout
tblOffRoadEquipment	PhaseName		Zayante Creek Crossing: CIDH Piles
tblOffRoadEquipment	PhaseName		Zayante Creek Crossing: Pipe support
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Outside Henry Cowell
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Inside Henry Cowell
tblOffRoadEquipment	PhaseName		Zayante Creek Crossing: Pipe support
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	PhaseName		Big Trees RR Crossing: Shaft excavation
tblOffRoadEquipment	PhaseName		Zayante Creek Crossing: Pier scour protect
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Paving
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Paving
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Outside Henry Cowell
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Inside Henry Cowell
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Paving
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Pressure test

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	PhaseName		GH Rd South: Test pipeline
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Road removal/pipe install
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd North: Road removal/pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Paving
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Road removal/pipe install
tblOffRoadEquipment	PhaseName		GH Rd South: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Pavement striping
tblOffRoadEquipment	PhaseName		GH Rd South: Cathodic protection
tblOffRoadEquipment	PhaseName		Big Trees RR Crossing: Pipe install
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Paving
tblOffRoadEquipment	PhaseName		FBPS to Zayante: Paving
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Paving
tblOffRoadEquipment	PhaseName		Zayante to Big Trees RR: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Paving
tblOffRoadEquipment	PhaseName		GH Rd North: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: Paving
tblOffRoadEquipment	PhaseName		GH Rd South: GHWTP tie in
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Outside Henry Cowell
tblOffRoadEquipment	PhaseName		Abandon Existing NCP: Inside Henry Cowell

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	3.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	3.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	3.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	3.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	50.00
tblTripsAndVMT	HaulingTripNumber	0.00	80.00
tblTripsAndVMT	HaulingTripNumber	0.00	40.00
tblTripsAndVMT	HaulingTripNumber	29.00	33.00
tblTripsAndVMT	HaulingTripNumber	0.00	10.00
tblTripsAndVMT	HaulingTripNumber	0.00	18.00
tblTripsAndVMT	HaulingTripNumber	0.00	63.00
tblTripsAndVMT	HaulingTripNumber	0.00	30.00
tblTripsAndVMT	HaulingTripNumber	0.00	50.00
tblTripsAndVMT	HaulingTripNumber	380.00	0.00
tblTripsAndVMT	HaulingTripNumber	0.00	812.00
tblTripsAndVMT	HaulingTripNumber	1,139.00	2,437.00
tblTripsAndVMT	HaulingTripNumber	3,341.00	7,148.00
tblTripsAndVMT	HaulingTripNumber	0.00	45.00
tblTripsAndVMT	HaulingTripNumber	0.00	67.00
tblTripsAndVMT	HaulingTripNumber	0.00	449.00
tblTripsAndVMT	HaulingTripNumber	106.00	133.00
tblTripsAndVMT	HaulingTripNumber	3,038.00	6,498.00
tblTripsAndVMT	HaulingTripNumber	0.00	449.00
tblTripsAndVMT	HaulingTripNumber	0.00	173.00
tblTripsAndVMT	HaulingTripNumber	0.00	404.00
tblTripsAndVMT	HaulingTripNumber	106.00	133.00
tblTripsAndVMT	HaulingTripNumber	0.00	17.00
tblTripsAndVMT	HaulingTripNumber	0.00	23.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	HaulingTripNumber	0.00	260.00
tblTripsAndVMT	HaulingTripNumber	0.00	64.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	12.00
tblTripsAndVMT	VendorTripNumber	0.00	12.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	76.00	4.00
tblTripsAndVMT	VendorTripNumber	76.00	6.00
tblTripsAndVMT	VendorTripNumber	76.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	76.00	2.00
tblTripsAndVMT	VendorTripNumber	76.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	58.00
tblTripsAndVMT	VendorTripNumber	0.00	85.00
tblTripsAndVMT	VendorTripNumber	0.00	78.00
tblTripsAndVMT	VendorTripNumber	0.00	50.00
tblTripsAndVMT	VendorTripNumber	0.00	72.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	50.00
tblTripsAndVMT	VendorTripNumber	0.00	16.00
tblTripsAndVMT	VendorTripNumber	0.00	112.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	93.00

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	14.00
tblTripsAndVMT	VendorTripNumber	0.00	14.00
tblTripsAndVMT	VendorTripNumber	0.00	16.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	16.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	12.00
tblTripsAndVMT	WorkerTripNumber	8.00	16.00
tblTripsAndVMT	WorkerTripNumber	18.00	16.00
tblTripsAndVMT	WorkerTripNumber	10.00	20.00
tblTripsAndVMT	WorkerTripNumber	5.00	4.00
tblTripsAndVMT	WorkerTripNumber	3.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	2.00
tblTripsAndVMT	WorkerTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	196.00	8.00
tblTripsAndVMT	WorkerTripNumber	196.00	6.00
tblTripsAndVMT	WorkerTripNumber	196.00	8.00
tblTripsAndVMT	WorkerTripNumber	8.00	16.00
tblTripsAndVMT	WorkerTripNumber	196.00	2.00
tblTripsAndVMT	WorkerTripNumber	196.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	6.00
tblTripsAndVMT	WorkerTripNumber	28.00	32.00
tblTripsAndVMT	WorkerTripNumber	28.00	36.00
tblTripsAndVMT	WorkerTripNumber	28.00	34.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	WorkerTripNumber	18.00	22.00
tblTripsAndVMT	WorkerTripNumber	18.00	22.00
tblTripsAndVMT	WorkerTripNumber	3.00	4.00
tblTripsAndVMT	WorkerTripNumber	18.00	22.00
tblTripsAndVMT	WorkerTripNumber	30.00	16.00
tblTripsAndVMT	WorkerTripNumber	28.00	34.00
tblTripsAndVMT	WorkerTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	4.00
tblTripsAndVMT	WorkerTripNumber	18.00	22.00
tblTripsAndVMT	WorkerTripNumber	3.00	2.00
tblTripsAndVMT	WorkerTripNumber	39.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	2.00
tblTripsAndVMT	WorkerTripNumber	8.00	6.00
tblTripsAndVMT	WorkerTripNumber	8.00	6.00
tblTripsAndVMT	WorkerTripNumber	30.00	16.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	45.00	16.00
tblTripsAndVMT	WorkerTripNumber	13.00	16.00
tblTripsAndVMT	WorkerTripNumber	5.00	6.00
tblTripsAndVMT	WorkerTripNumber	18.00	16.00

2.0 Emissions Summary

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.2845	2.5617	3.2608	6.3200e-003	0.1915	0.1236	0.3151	0.0479	0.1195	0.1673	0.0000	553.3318	553.3318	0.0889	7.2300e-003	557.7081
2023	0.0663	1.0190	0.7941	3.0800e-003	0.0688	0.0247	0.0934	0.0188	0.0231	0.0419	0.0000	289.3587	289.3587	0.0310	0.0288	298.7177
2024	0.2239	2.0645	0.8343	6.9500e-003	0.1999	0.0227	0.2225	0.0543	0.0215	0.0758	0.0000	673.6311	673.6311	0.0322	0.0925	702.0072
2025	3.8200e-003	0.0749	0.0284	2.4000e-004	6.6600e-003	1.0100e-003	7.6700e-003	1.8400e-003	9.8000e-004	2.8200e-003	0.0000	22.5372	22.5372	9.3000e-004	3.0400e-003	23.4649
Maximum	**0.2845**	**2.5617**	**3.2608**	**6.9500e-003**	**0.1999**	**0.1236**	**0.3151**	**0.0543**	**0.1195**	**0.1673**	**0.0000**	**673.6311**	**673.6311**	**0.0889**	**0.0925**	**702.0072**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.2845	2.5617	3.2608	6.3200e-003	0.1914	0.1236	0.3151	0.0478	0.1195	0.1673	0.0000	553.3312	553.3312	0.0889	7.2300e-003	557.7075
2023	0.0663	1.0190	0.7941	3.0800e-003	0.0683	0.0247	0.0930	0.0187	0.0231	0.0419	0.0000	289.3586	289.3586	0.0310	0.0288	298.7176
2024	0.2239	2.0645	0.8343	6.9500e-003	0.1965	0.0227	0.2191	0.0539	0.0215	0.0753	0.0000	673.6310	673.6310	0.0322	0.0925	702.0071
2025	3.8200e-003	0.0749	0.0284	2.4000e-004	6.6600e-003	1.0100e-003	7.6700e-003	1.8400e-003	9.8000e-004	2.8200e-003	0.0000	22.5372	22.5372	9.3000e-004	3.0400e-003	23.4649
Maximum	**0.2845**	**2.5617**	**3.2608**	**6.9500e-003**	**0.1965**	**0.1236**	**0.3151**	**0.0539**	**0.1195**	**0.1673**	**0.0000**	**673.6310**	**673.6310**	**0.0889**	**0.0925**	**702.0071**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.83**	**0.00**	**0.61**	**0.39**	**0.00**	**0.17**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**8-22-2022**	**11-21-2022**	2.0217	2.0217
2	**11-22-2022**	**2-21-2023**	1.0788	1.0788
3	**2-22-2023**	**5-21-2023**	0.1551	0.1551
4	**5-22-2023**	**8-21-2023**	0.0253	0.0253
5	**8-22-2023**	**11-21-2023**	0.4539	0.4539
6	**11-22-2023**	**2-21-2024**	0.4428	0.4428
7	**2-22-2024**	**5-21-2024**	0.6223	0.6223
8	**5-22-2024**	**8-21-2024**	0.4445	0.4445

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

9	**8-22-2024**	**11-21-2024**	0.8414	0.8414
10	**11-22-2024**	**2-21-2025**	0.1104	0.1104
		Highest	2.0217	2.0217

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0301	0.0000	1.4000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.7000e-004	2.7000e-004	0.0000	0.0000	2.8000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0301**	**0.0000**	**1.4000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.7000e-004**	**2.7000e-004**	**0.0000**	**0.0000**	**2.8000e-004**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0301	0.0000	1.4000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.7000e-004	2.7000e-004	0.0000	0.0000	2.8000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0301**	**0.0000**	**1.4000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.7000e-004**	**2.7000e-004**	**0.0000**	**0.0000**	**2.8000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Brackney North: Mobilization (South HDD pit)	Site Preparation	8/22/2022	9/23/2022	5	25	
2	Brackney North: Mobilization (North HDD pit)	Site Preparation	8/22/2022	9/23/2022	5	25	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3	Brackney North: HDD (South entry)	Grading	9/21/2022	12/12/2022	5	59	
4	Brackney North: HDD (North entry)	Grading	9/21/2022	12/12/2022	5	59	
5	Brackney North: Carrier pipeline staging area prep	Site Preparation	10/28/2022	12/14/2022	5	34	
6	Brackney North: HDD (pullback)	Trenching	12/15/2022	12/16/2022	5	2	
7	Brackney North: Tie-in pipeline construction	Trenching	12/22/2022	1/26/2023	5	26	
8	NCP FBPS to Graham Hill WTP: Staging area	Grading	1/12/2023	4/6/2023	5	40	
9	Brackney North: Abandon existing pipeline	Trenching	1/27/2023	2/3/2023	5	6	
10	Brackney North: Restoration	Site Preparation	2/6/2023	3/3/2023	5	20	
11	Brackney North: Demobilization	Site Preparation	3/6/2023	3/17/2023	5	10	
12	Big Trees RR Crossing: Shaft excavation	Grading	4/7/2023	4/13/2023	5	5	
13	Big Trees RR Crossing: Boring and casing	Trenching	4/14/2023	4/27/2023	5	10	
14	Big Trees RR Crossing: Pipe install	Trenching	4/28/2023	5/4/2023	5	5	
15	Big Trees RR Crossing: Grout	Trenching	5/5/2023	5/11/2023	5	5	
16	Big Trees RR Crossing: Backfill	Trenching	5/12/2023	5/18/2023	5	5	
17	Zayante Creek Crossing: CIDH Piles	Building Construction	8/1/2023	8/14/2023	5	15	
18	Zayante Creek Crossing: Pier scour protect	Building Construction	8/15/2023	8/23/2023	5	10	
19	Zayante Creek Crossing: Pipe support	Building Construction	8/29/2023	9/19/2023	5	15	
20	Zayante Creek Crossing: Install pipe span	Building Construction	9/20/2023	10/10/2023	5	15	
21	Zayante Creek Crossing: Install flex connect	Building Construction	10/11/2023	10/17/2023	5	5	
22	Zayante Creek Crossing: Grade for drainage	Grading	10/18/2023	10/24/2023	5	5	
23	FBPS to Zayante: Road removal/pipe install	Grading	10/18/2023	11/7/2023	5	15	
24	Zayante to Big Trees RR: Road removal/pipe install	Grading	10/25/2023	12/7/2023	5	30	
25	GH Rd North: Road removal/pipe install	Grading	1/9/2024	5/23/2024	5	132	
26	FBPS to Zayante: Paving	Paving	4/16/2024	4/16/2024	5	1	
27	Zayante to Big Trees RR: Paving	Paving	4/17/2024	4/17/2024	5	1	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

28	GH Rd North: Pressure test	Trenching	7/17/2024	7/23/2024	5	5	
29	GH Rd North: Paving	Paving	7/17/2024	7/30/2024	5	10	
30	GH Rd South: Road removal/pipe install	Grading	7/24/2024	10/16/2024	5	60	
31	GH Rd North: Tie in to FBPS	Trenching	7/24/2024	7/30/2024	5	5	
32	GH Rd South: Test pipeline	Trenching	10/17/2024	10/24/2024	5	5	
33	GH Rd South: Paving	Paving	10/17/2024	10/23/2024	5	5	
34	GH Rd South: GHWTP tie in	Trenching	10/24/2024	10/25/2024	5	2	
35	GH Rd South: Pavement striping	Architectural Coating	10/24/2024	10/30/2024	5	5	
36	GH Rd South: Cathodic protection	Trenching	10/27/2024	11/8/2024	5	10	
37	Abandon Existing NCP: Outside Henry Cowell	Trenching	12/11/2024	1/2/2025	5	15	
38	Abandon Existing NCP: Inside Henry Cowell	Trenching	1/3/2025	2/21/2025	5	35	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 10.7

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 27,966 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Brackney North: Mobilization (South HDD pit)	Excavators	1	8.00	158	0.38
Brackney North: Mobilization (South HDD pit)	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: Mobilization (South HDD pit)	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Brackney North: Mobilization (South HDD pit)	Dumpers/Tenders	1	8.00	16	0.38
Brackney North: Mobilization (North HDD pit)	Excavators	1	8.00	158	0.38
Brackney North: Mobilization (North HDD pit)	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: Mobilization (North HDD pit)	Tractors/Loaders/Backhoes	1	8.00	97	0.37

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Brackney North: Mobilization (North HDD pit)	Dumpers/Tenders	1	8.00	16	0.38
Brackney North: HDD (South entry)	Pumps	3	10.00	84	0.74
Brackney North: HDD (South entry)	Excavators	1	10.00	158	0.38
Brackney North: HDD (South entry)	Tractors/Loaders/Backhoes	1	10.00	97	0.37
Brackney North: HDD (South entry)	Bore/Drill Rigs	1	10.00	221	0.50
Brackney North: HDD (South entry)	Other Material Handling Equipment	1	10.00	168	0.40
Brackney North: HDD (South entry)	Forklifts	1	10.00	89	0.20
Brackney North: HDD (South entry)	Generator Sets	3	10.00	84	0.74
Brackney North: HDD (South entry)	Other General Industrial Equipment	1	10.00	88	0.34
Brackney North: HDD (North entry)	Pumps	3	10.00	84	0.74
Brackney North: HDD (North entry)	Excavators	1	10.00	158	0.38
Brackney North: HDD (North entry)	Tractors/Loaders/Backhoes	1	10.00	97	0.37
Brackney North: HDD (North entry)	Bore/Drill Rigs	1	10.00	221	0.50
Brackney North: HDD (North entry)	Other Material Handling Equipment	1	10.00	168	0.40
Brackney North: HDD (North entry)	Forklifts	1	10.00	89	0.20
Brackney North: HDD (North entry)	Generator Sets	3	10.00	84	0.74
Brackney North: HDD (North entry)	Other General Industrial Equipment	1	10.00	88	0.34
Brackney North: Carrier pipeline staging area prep	Excavators	2	8.00	158	0.38
Brackney North: Carrier pipeline staging area prep	Welders	1	8.00	46	0.45
Brackney North: Carrier pipeline staging area prep	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: Carrier pipeline staging area prep	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Brackney North: HDD (pullback)	Excavators	5	24.00	158	0.38
Brackney North: HDD (pullback)	Bore/Drill Rigs	1	24.00	221	0.50
Brackney North: HDD (pullback)	Other Material Handling Equipment	1	24.00	168	0.40
Brackney North: HDD (pullback)	Pumps	3	24.00	84	0.74
Brackney North: HDD (pullback)	Generator Sets	6	10.00	84	0.74
Brackney North: HDD (pullback)	Other General Industrial Equipment	2	10.00	88	0.34

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Brackney North: Tie-in pipeline construction	Pavers	1	8.00	130	0.42
Brackney North: Tie-in pipeline construction	Paving Equipment	1	8.00	132	0.36
Brackney North: Tie-in pipeline construction	Rollers	1	8.00	80	0.38
Brackney North: Tie-in pipeline construction	Welders	1	8.00	46	0.45
Brackney North: Tie-in pipeline construction	Excavators	1	8.00	158	0.38
Brackney North: Abandon existing pipeline	Generator Sets	1	8.00	84	0.74
Brackney North: Abandon existing pipeline	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Brackney North: Abandon existing pipeline	Excavators	1	8.00	158	0.38
Brackney North: Abandon existing pipeline	Cement and Mortar Mixers	2	8.00	9	0.56
Brackney North: Abandon existing pipeline	Pumps	2	8.00	84	0.74
Brackney North: Restoration	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: Restoration	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Brackney North: Restoration	Air Compressors	1	8.00	78	0.48
Brackney North: Restoration	Excavators	2	8.00	158	0.38
Brackney North: Restoration	Rollers	2	8.00	80	0.38
Brackney North: Demobilization	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: Demobilization	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Brackney North: Demobilization	Excavators	2	8.00	158	0.38
NCP FBPS to Graham Hill WTP: Staging area	Excavators	0	8.00	158	0.38
NCP FBPS to Graham Hill WTP: Staging area	Graders	0	8.00	187	0.41
NCP FBPS to Graham Hill WTP: Staging area	Rubber Tired Dozers	0	8.00	247	0.40
NCP FBPS to Graham Hill WTP: Staging area	Scrapers	0	8.00	367	0.48
NCP FBPS to Graham Hill WTP: Staging area	Tractors/Loaders/Backhoes	1	8.00	97	0.37
NCP FBPS to Graham Hill WTP: Staging area	Dumpers/Tenders	1	4.00	16	0.38
Big Trees RR Crossing: Shaft excavation	Dumpers/Tenders	1	8.00	16	0.38

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Big Trees RR Crossing: Shaft excavation	Excavators	1	8.00	158	0.38
Big Trees RR Crossing: Boring and casing	Bore/Drill Rigs	1	8.00	221	0.50
Big Trees RR Crossing: Pipe install	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Big Trees RR Crossing: Grout	Cement and Mortar Mixers	1	8.00	9	0.56
Big Trees RR Crossing: Backfill	Aerial Lifts	0	1.00	63	0.31
Zayante Creek Crossing: CIDH Piles	Cranes	0	7.00	231	0.29
Zayante Creek Crossing: CIDH Piles	Forklifts	0	8.00	89	0.20
Zayante Creek Crossing: CIDH Piles	Generator Sets	0	8.00	84	0.74
Zayante Creek Crossing: CIDH Piles	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Zayante Creek Crossing: CIDH Piles	Welders	0	8.00	46	0.45
Zayante Creek Crossing: CIDH Piles	Cement and Mortar Mixers	1	8.00	9	0.56
Zayante Creek Crossing: CIDH Piles	Bore/Drill Rigs	1	8.00	221	0.50
Zayante Creek Crossing: Pier scour protect	Cranes	0	7.00	231	0.29
Zayante Creek Crossing: Pier scour protect	Forklifts	0	8.00	89	0.20
Zayante Creek Crossing: Pier scour protect	Generator Sets	0	8.00	84	0.74
Zayante Creek Crossing: Pier scour protect	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Zayante Creek Crossing: Pier scour protect	Welders	0	8.00	46	0.45
Zayante Creek Crossing: Pier scour protect	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Zayante Creek Crossing: Pier scour protect	Dumpers/Tenders	1	3.00	16	0.38
Zayante Creek Crossing: Pipe support	Cranes	0	7.00	231	0.29
Zayante Creek Crossing: Pipe support	Forklifts	0	8.00	89	0.20
Zayante Creek Crossing: Pipe support	Generator Sets	0	8.00	84	0.74
Zayante Creek Crossing: Pipe support	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Zayante Creek Crossing: Pipe support	Welders	0	8.00	46	0.45
Zayante Creek Crossing: Pipe support	Cement and Mortar Mixers	1	8.00	9	0.56
Zayante Creek Crossing: Pipe support	Concrete/Industrial Saws	1	1.00	81	0.73
Zayante Creek Crossing: Install pipe span	Cranes	1	8.00	231	0.29

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Zayante Creek Crossing: Install pipe span	Forklifts	0	8.00	89	0.20
Zayante Creek Crossing: Install pipe span	Generator Sets	0	8.00	84	0.74
Zayante Creek Crossing: Install pipe span	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Zayante Creek Crossing: Install pipe span	Welders	0	8.00	46	0.45
Zayante Creek Crossing: Install flex connect	Cranes	0	7.00	231	0.29
Zayante Creek Crossing: Install flex connect	Forklifts	0	8.00	89	0.20
Zayante Creek Crossing: Install flex connect	Generator Sets	0	8.00	84	0.74
Zayante Creek Crossing: Install flex connect	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Zayante Creek Crossing: Install flex connect	Welders	0	8.00	46	0.45
Zayante Creek Crossing: Grade for drainage	Excavators	0	8.00	158	0.38
Zayante Creek Crossing: Grade for drainage	Graders	0	8.00	187	0.41
Zayante Creek Crossing: Grade for drainage	Rubber Tired Dozers	0	8.00	247	0.40
Zayante Creek Crossing: Grade for drainage	Scrapers	0	8.00	367	0.48
Zayante Creek Crossing: Grade for drainage	Tractors/Loaders/Backhoes	1	8.00	97	0.37
FBPS to Zayante: Road removal/pipe install	Air Compressors	0	1.00	78	0.48
FBPS to Zayante: Road removal/pipe install	Excavators	1	1.00	158	0.38
FBPS to Zayante: Road removal/pipe install	Tractors/Loaders/Backhoes	1	1.00	97	0.37
FBPS to Zayante: Road removal/pipe install	Graders	0	8.00	187	0.41
FBPS to Zayante: Road removal/pipe install	Concrete/Industrial Saws	1	1.00	81	0.73
FBPS to Zayante: Road removal/pipe install	Dumpers/Tenders	1	1.00	16	0.38
FBPS to Zayante: Road removal/pipe install	Skid Steer Loaders	1	1.00	65	0.37
FBPS to Zayante: Road removal/pipe install	Excavators	1	3.00	158	0.38
FBPS to Zayante: Road removal/pipe install	Cement and Mortar Mixers	1	2.00	9	0.56

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

FBPS to Zayante: Road removal/pipe install	Tractors/Loaders/Backhoes	1	2.00	170	0.37
FBPS to Zayante: Road removal/pipe install	Rollers	1	0.50	80	0.38
FBPS to Zayante: Road removal/pipe install	Plate Compactors	1	0.50	8	0.43
FBPS to Zayante: Road removal/pipe install	Dumpers/Tenders	1	0.50	16	0.38
FBPS to Zayante: Paving	Pavers	1	5.00	75	0.42
FBPS to Zayante: Paving	Paving Equipment	0	8.00	132	0.36
FBPS to Zayante: Paving	Rollers	1	5.00	170	0.38
FBPS to Zayante: Paving	Tractors/Loaders/Backhoes	1	5.00	97	0.37
FBPS to Zayante: Paving	Tractors/Loaders/Backhoes	1	5.00	170	0.37
FBPS to Zayante: Paving	Skid Steer Loaders	1	5.00	80	0.37
FBPS to Zayante: Paving	Plate Compactors	1	5.00	8	0.43
FBPS to Zayante: Paving	Dumpers/Tenders	1	5.00	16	0.38
Zayante to Big Trees RR: Road removal/pipe install	Air Compressors	0	1.00	78	0.48
Zayante to Big Trees RR: Road removal/pipe install	Excavators	1	1.00	158	0.38
Zayante to Big Trees RR: Road removal/pipe install	Tractors/Loaders/Backhoes	1	1.00	97	0.37
Zayante to Big Trees RR: Road removal/pipe install	Graders	0	8.00	187	0.41
Zayante to Big Trees RR: Road removal/pipe install	Concrete/Industrial Saws	1	1.00	81	0.73
Zayante to Big Trees RR: Road removal/pipe install	Dumpers/Tenders	1	1.00	16	0.38
Zayante to Big Trees RR: Road removal/pipe install	Skid Steer Loaders	1	1.00	65	0.37
Zayante to Big Trees RR: Road removal/pipe install	Excavators	1	3.00	158	0.38
Zayante to Big Trees RR: Road removal/pipe install	Cement and Mortar Mixers	1	2.00	9	0.56
Zayante to Big Trees RR: Road removal/pipe install	Tractors/Loaders/Backhoes	1	2.00	170	0.37
Zayante to Big Trees RR: Road removal/pipe install	Rollers	1	0.50	80	0.38
Zayante to Big Trees RR: Road removal/pipe install	Plate Compactors	1	0.50	8	0.43
Zayante to Big Trees RR: Road removal/pipe install	Dumpers/Tenders	1	0.50	16	0.38

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Zayante to Big Trees RR: Paving	Pavers	1	5.00	75	0.42
Zayante to Big Trees RR: Paving	Paving Equipment	0	8.00	132	0.36
Zayante to Big Trees RR: Paving	Rollers	1	5.00	170	0.38
Zayante to Big Trees RR: Paving	Tractors/Loaders/Backhoes	1	5.00	97	0.37
Zayante to Big Trees RR: Paving	Tractors/Loaders/Backhoes	1	5.00	170	0.37
Zayante to Big Trees RR: Paving	Skid Steer Loaders	1	5.00	80	0.37
Zayante to Big Trees RR: Paving	Plate Compactors	1	5.00	8	0.43
Zayante to Big Trees RR: Paving	Dumpers/Tenders	1	5.00	16	0.38
GH Rd North: Road removal/pipe install	Air Compressors	0	1.00	78	0.48
GH Rd North: Road removal/pipe install	Excavators	1	1.00	158	0.38
GH Rd North: Road removal/pipe install	Tractors/Loaders/Backhoes	1	1.00	97	0.37
GH Rd North: Road removal/pipe install	Graders	0	8.00	187	0.41
GH Rd North: Road removal/pipe install	Concrete/Industrial Saws	1	1.00	81	0.73
GH Rd North: Road removal/pipe install	Dumpers/Tenders	1	1.00	16	0.38
GH Rd North: Road removal/pipe install	Skid Steer Loaders	1	1.00	65	0.37
GH Rd North: Road removal/pipe install	Excavators	1	3.00	158	0.38
GH Rd North: Road removal/pipe install	Cement and Mortar Mixers	1	2.00	9	0.56
GH Rd North: Road removal/pipe install	Tractors/Loaders/Backhoes	1	2.00	170	0.37
GH Rd North: Road removal/pipe install	Rollers	1	0.50	80	0.38
GH Rd North: Road removal/pipe install	Plate Compactors	1	0.50	8	0.43
GH Rd North: Road removal/pipe install	Dumpers/Tenders	1	0.50	16	0.38
GH Rd North: Paving	Pavers	1	5.00	75	0.42
GH Rd North: Paving	Paving Equipment	0	8.00	132	0.36
GH Rd North: Paving	Rollers	1	5.00	170	0.38
GH Rd North: Paving	Tractors/Loaders/Backhoes	1	5.00	97	0.37
GH Rd North: Paving	Tractors/Loaders/Backhoes	1	5.00	170	0.37
GH Rd North: Paving	Skid Steer Loaders	1	5.00	80	0.37
GH Rd North: Paving	Plate Compactors	1	5.00	8	0.43
GH Rd North: Paving	Dumpers/Tenders	1	5.00	16	0.38

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GH Rd North: Pressure test	Pumps	1	8.00	84	0.74
GH Rd North: Tie in to FBPS	Air Compressors	0	1.00	78	0.48
GH Rd South: Road removal/pipe install	Air Compressors	0	1.00	78	0.48
GH Rd South: Road removal/pipe install	Excavators	1	1.00	158	0.38
GH Rd South: Road removal/pipe install	Tractors/Loaders/Backhoes	1	1.00	97	0.37
GH Rd South: Road removal/pipe install	Graders	0	8.00	187	0.41
GH Rd South: Road removal/pipe install	Concrete/Industrial Saws	1	1.00	81	0.73
GH Rd South: Road removal/pipe install	Dumpers/Tenders	1	1.00	16	0.38
GH Rd South: Road removal/pipe install	Skid Steer Loaders	1	1.00	65	0.37
GH Rd South: Road removal/pipe install	Excavators	1	3.00	158	0.38
GH Rd South: Road removal/pipe install	Cement and Mortar Mixers	1	2.00	9	0.56
GH Rd South: Road removal/pipe install	Tractors/Loaders/Backhoes	1	2.00	170	0.37
GH Rd South: Road removal/pipe install	Rollers	1	0.50	80	0.38
GH Rd South: Road removal/pipe install	Plate Compactors	1	0.50	8	0.43
GH Rd South: Road removal/pipe install	Dumpers/Tenders	1	0.50	16	0.38
GH Rd South: Paving	Pavers	1	5.00	75	0.42
GH Rd South: Paving	Paving Equipment	0	8.00	132	0.36
GH Rd South: Paving	Rollers	1	5.00	170	0.38
GH Rd South: Paving	Tractors/Loaders/Backhoes	1	5.00	97	0.37
GH Rd South: Paving	Tractors/Loaders/Backhoes	1	5.00	170	0.37
GH Rd South: Paving	Skid Steer Loaders	1	5.00	80	0.37
GH Rd South: Paving	Plate Compactors	1	5.00	8	0.43
GH Rd South: Paving	Dumpers/Tenders	1	5.00	16	0.38
GH Rd South: Pavement striping	Surfacing Equipment	1	8.00	263	0.30
GH Rd South: Test pipeline	Pumps	1	8.00	84	0.74
GH Rd South: GHWTP tie in	Tractors/Loaders/Backhoes	1	8.00	97	0.37
GH Rd South: Cathodic protection	Surfacing Equipment	1	8.00	263	0.30
Abandon Existing NCP: Outside Henry Cowell	Cement and Mortar Mixers	1	5.00	9	0.56

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Abandon Existing NCP: Outside Henry Cowell	Dumpers/Tenders	1	8.00	16	0.38
Abandon Existing NCP: Outside Henry Cowell	Tractors/Loaders/Backhoes	1	1.00	97	0.37
Abandon Existing NCP: Inside Henry Cowell	Cement and Mortar Mixers	1	5.00	9	0.56
Abandon Existing NCP: Inside Henry Cowell	Dumpers/Tenders	1	8.00	16	0.38
Abandon Existing NCP: Inside Henry Cowell	Tractors/Loaders/Backhoes	1	1.00	97	0.37
Brackney North: HDD (South entry)	Graders	0	1.00	187	0.41
Brackney North: HDD (North entry)	Graders	0	1.00	187	0.41
GH Rd South: Pavement striping	Air Compressors	0	6.00	78	0.48
FBPS to Zayante: Road removal/pipe install	Rubber Tired Dozers	0	8.00	247	0.40
Zayante to Big Trees RR: Road removal/pipe install	Rubber Tired Dozers	0	8.00	247	0.40
GH Rd North: Road removal/pipe install	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: HDD (South entry)	Rubber Tired Dozers	0	8.00	247	0.40
GH Rd South: Road removal/pipe install	Rubber Tired Dozers	0	8.00	247	0.40
Brackney North: HDD (North entry)	Rubber Tired Dozers	0	8.00	247	0.40
FBPS to Zayante: Road removal/pipe install	Scrapers	0	8.00	367	0.48
Zayante to Big Trees RR: Road removal/pipe install	Scrapers	0	8.00	367	0.48
GH Rd North: Road removal/pipe install	Scrapers	0	8.00	367	0.48
Brackney North: HDD (South entry)	Scrapers	0	8.00	367	0.48
GH Rd South: Road removal/pipe install	Scrapers	0	8.00	367	0.48
Brackney North: HDD (North entry)	Scrapers	0	8.00	367	0.48
Big Trees RR Crossing: Shaft excavation	Graders	0	8.00	187	0.41
Big Trees RR Crossing: Shaft excavation	Rubber Tired Dozers	0	8.00	247	0.40
Big Trees RR Crossing: Shaft excavation	Scrapers	0	8.00	367	0.48
Big Trees RR Crossing: Shaft excavation	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

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Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Brackney North: Mobilization (South H	3	16.00	8.00	50.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Mobilization (North HD	3	16.00	8.00	50.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: HDD (South entry)	12	16.00	16.00	133.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: HDD (North entry)	12	16.00	16.00	133.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Carrier pipeline stagin	3	10.00	8.00	17.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: HDD (pullback)	18	16.00	8.00	23.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Tie-in pipeline construction	5	16.00	16.00	260.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Abandon existing pipel	7	16.00	12.00	64.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Restoration	7	16.00	12.00	80.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney North: Demobilization	4	20.00	12.00	40.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
NCP FBPS to Graham Hill WTP: Staging are	2	6.00	6.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Big Trees RR Crossing: Shaft excav	2	4.00	8.00	33.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Big Trees RR Crossing: Boring and	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Big Trees RR Crossing: Pipe install	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Big Trees RR Crossing: Grout	1	2.00	2.00	10.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Big Trees RR Crossing: Backfill	0	2.00	4.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: CIDH Piles	2	8.00	4.00	18.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: Pier scour p	2	6.00	6.00	63.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: Pipe suppor	2	8.00	2.00	30.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: Install pipe s	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: Install flex c	1	2.00	4.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante Creek Crossing: Grade for dr	1	6.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
FBPS to Zayante: Road removal/pipe ins	11	32.00	58.00	812.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
FBPS to Zayante: Paving	7	22.00	50.00	45.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante to Big Trees RR: Road removal/pip	11	36.00	85.00	2,437.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Zayante to Big Trees RR: Paving	7	22.00	72.00	67.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd North: Road removal/pipe install	11	34.00	78.00	7,148.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

GH Rd North: Paving	7	22.00	50.00	449.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd North: Pressure test	1	4.00	4.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd North: Tie in to ERPS	0	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: Road removal/pipe install	11	34.00	112.00	6,498.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: Paving	7	22.00	93.00	449.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: Pavement striping	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: Test pipeline	1	4.00	4.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: GHWTP tie in	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
GH Rd South: Cathodic protection	1	2.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Abandon Existing NCP: Outside Henry C	3	6.00	14.00	173.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Abandon Existing NCP: Inside Henry Co	3	6.00	14.00	404.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Brackney North: Mobilization (South HDD pit) - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.5100e-003	0.0490	0.0718	1.1000e-004		2.4200e-003	2.4200e-003		2.2400e-003	2.2400e-003	0.0000	9.7771	9.7771	3.0100e-003	0.0000	9.8524
Total	**5.5100e-003**	**0.0490**	**0.0718**	**1.1000e-004**	**0.0000**	**2.4200e-003**	**2.4200e-003**	**0.0000**	**2.2400e-003**	**2.2400e-003**	**0.0000**	**9.7771**	**9.7771**	**3.0100e-003**	**0.0000**	**9.8524**

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3.2 Brackney North: Mobilization (South HDD pit) - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.2000e-004	6.2700e-003	8.9000e-004	2.0000e-005	3.9000e-003	5.0000e-005	3.9500e-003	9.7000e-004	5.0000e-005	1.0200e-003	0.0000	1.7554	1.7554	5.0000e-005	2.8000e-004	1.8395
Vendor	2.3000e-004	6.9800e-003	1.6200e-003	2.0000e-005	5.1900e-003	6.0000e-005	5.2600e-003	1.3000e-003	6.0000e-005	1.3600e-003	0.0000	2.0017	2.0017	4.0000e-005	3.0000e-004	2.0926
Worker	9.7000e-004	8.5000e-004	9.1200e-003	2.0000e-005	0.0259	2.0000e-005	0.0259	6.4000e-003	2.0000e-005	6.4200e-003	0.0000	2.0569	2.0569	7.0000e-005	7.0000e-005	2.0783
Total	**1.3200e-003**	**0.0141**	**0.0116**	**6.0000e-005**	**0.0350**	**1.3000e-004**	**0.0351**	**8.6700e-003**	**1.3000e-004**	**8.8000e-003**	**0.0000**	**5.8140**	**5.8140**	**1.6000e-004**	**6.5000e-004**	**6.0104**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.5100e-003	0.0490	0.0718	1.1000e-004		2.4200e-003	2.4200e-003		2.2400e-003	2.2400e-003	0.0000	9.7771	9.7771	3.0100e-003	0.0000	9.8524
Total	**5.5100e-003**	**0.0490**	**0.0718**	**1.1000e-004**	**0.0000**	**2.4200e-003**	**2.4200e-003**	**0.0000**	**2.2400e-003**	**2.2400e-003**	**0.0000**	**9.7771**	**9.7771**	**3.0100e-003**	**0.0000**	**9.8524**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Brackney North: Mobilization (South HDD pit) - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.2000e-004	6.2700e-003	8.9000e-004	2.0000e-005	3.9000e-003	5.0000e-005	3.9500e-003	9.7000e-004	5.0000e-005	1.0200e-003	0.0000	1.7554	1.7554	5.0000e-005	2.8000e-004	1.8395
Vendor	2.3000e-004	6.9800e-003	1.6200e-003	2.0000e-005	5.1900e-003	6.0000e-005	5.2600e-003	1.3000e-003	6.0000e-005	1.3600e-003	0.0000	2.0017	2.0017	4.0000e-005	3.0000e-004	2.0926
Worker	9.7000e-004	8.5000e-004	9.1200e-003	2.0000e-005	0.0259	2.0000e-005	0.0259	6.4000e-003	2.0000e-005	6.4200e-003	0.0000	2.0569	2.0569	7.0000e-005	7.0000e-005	2.0783
Total	**1.3200e-003**	**0.0141**	**0.0116**	**6.0000e-005**	**0.0350**	**1.3000e-004**	**0.0351**	**8.6700e-003**	**1.3000e-004**	**8.8000e-003**	**0.0000**	**5.8140**	**5.8140**	**1.6000e-004**	**6.5000e-004**	**6.0104**

3.3 Brackney North: Mobilization (North HDD pit) - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.5100e-003	0.0490	0.0718	1.1000e-004		2.4200e-003	2.4200e-003		2.2400e-003	2.2400e-003	0.0000	9.7771	9.7771	3.0100e-003	0.0000	9.8524
Total	**5.5100e-003**	**0.0490**	**0.0718**	**1.1000e-004**	**0.0000**	**2.4200e-003**	**2.4200e-003**	**0.0000**	**2.2400e-003**	**2.2400e-003**	**0.0000**	**9.7771**	**9.7771**	**3.0100e-003**	**0.0000**	**9.8524**

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3.3 Brackney North: Mobilization (North HDD pit) - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.2000e-004	6.2700e-003	8.9000e-004	2.0000e-005	4.2200e-003	5.0000e-005	4.2700e-003	1.0500e-003	5.0000e-005	1.0900e-003	0.0000	1.7554	1.7554	5.0000e-005	2.8000e-004	1.8395
Vendor	2.3000e-004	6.9800e-003	1.6200e-003	2.0000e-005	5.6100e-003	6.0000e-005	5.6700e-003	1.4000e-003	6.0000e-005	1.4600e-003	0.0000	2.0017	2.0017	4.0000e-005	3.0000e-004	2.0926
Worker	9.7000e-004	8.5000e-004	9.1200e-003	2.0000e-005	0.0280	2.0000e-005	0.0280	6.9200e-003	2.0000e-005	6.9400e-003	0.0000	2.0569	2.0569	7.0000e-005	7.0000e-005	2.0783
Total	**1.3200e-003**	**0.0141**	**0.0116**	**6.0000e-005**	**0.0378**	**1.3000e-004**	**0.0380**	**9.3700e-003**	**1.3000e-004**	**9.4900e-003**	**0.0000**	**5.8140**	**5.8140**	**1.6000e-004**	**6.5000e-004**	**6.0104**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.5100e-003	0.0490	0.0718	1.1000e-004		2.4200e-003	2.4200e-003		2.2400e-003	2.2400e-003	0.0000	9.7771	9.7771	3.0100e-003	0.0000	9.8524
Total	**5.5100e-003**	**0.0490**	**0.0718**	**1.1000e-004**	**0.0000**	**2.4200e-003**	**2.4200e-003**	**0.0000**	**2.2400e-003**	**2.2400e-003**	**0.0000**	**9.7771**	**9.7771**	**3.0100e-003**	**0.0000**	**9.8524**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Brackney North: Mobilization (North HDD pit) - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.2000e-004	6.2700e-003	8.9000e-004	2.0000e-005	4.2200e-003	5.0000e-005	4.2700e-003	1.0500e-003	5.0000e-005	1.0900e-003	0.0000	1.7554	1.7554	5.0000e-005	2.8000e-004	1.8395
Vendor	2.3000e-004	6.9800e-003	1.6200e-003	2.0000e-005	5.6100e-003	6.0000e-005	5.6700e-003	1.4000e-003	6.0000e-005	1.4600e-003	0.0000	2.0017	2.0017	4.0000e-005	3.0000e-004	2.0926
Worker	9.7000e-004	8.5000e-004	9.1200e-003	2.0000e-005	0.0280	2.0000e-005	0.0280	6.9200e-003	2.0000e-005	6.9400e-003	0.0000	2.0569	2.0569	7.0000e-005	7.0000e-005	2.0783
Total	**1.3200e-003**	**0.0141**	**0.0116**	**6.0000e-005**	**0.0378**	**1.3000e-004**	**0.0380**	**9.3700e-003**	**1.3000e-004**	**9.4900e-003**	**0.0000**	**5.8140**	**5.8140**	**1.6000e-004**	**6.5000e-004**	**6.0104**

3.4 Brackney North: HDD (South entry) - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1179	1.0472	1.3500	2.4700e-003		0.0536	0.0536		0.0520	0.0520	0.0000	214.3883	214.3883	0.0351	0.0000	215.2646
Total	**0.1179**	**1.0472**	**1.3500**	**2.4700e-003**	**4.0000e-005**	**0.0536**	**0.0536**	**1.0000e-005**	**0.0520**	**0.0520**	**0.0000**	**214.3883**	**214.3883**	**0.0351**	**0.0000**	**215.2646**

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3.4 Brackney North: HDD (South entry) - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.2000e-004	0.0167	2.3700e-003	5.0000e-005	0.0112	1.3000e-004	0.0114	2.7900e-003	1.2000e-004	2.9100e-003	0.0000	4.6695	4.6695	1.3000e-004	7.4000e-004	4.8931
Vendor	1.0700e-003	0.0329	7.6300e-003	1.0000e-004	0.0265	3.1000e-004	0.0268	6.6200e-003	2.9000e-004	6.9100e-003	0.0000	9.4479	9.4479	1.9000e-004	1.4200e-003	9.8770
Worker	2.2900e-003	2.0100e-003	0.0215	5.0000e-005	0.0661	4.0000e-005	0.0661	0.0163	4.0000e-005	0.0164	0.0000	4.8543	4.8543	1.6000e-004	1.6000e-004	4.9048
Total	**3.6800e-003**	**0.0516**	**0.0315**	**2.0000e-004**	**0.1038**	**4.8000e-004**	**0.1043**	**0.0258**	**4.5000e-004**	**0.0262**	**0.0000**	**18.9716**	**18.9716**	**4.8000e-004**	**2.3200e-003**	**19.6749**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1179	1.0472	1.3500	2.4700e-003		0.0536	0.0536		0.0520	0.0520	0.0000	214.3880	214.3880	0.0351	0.0000	215.2644
Total	**0.1179**	**1.0472**	**1.3500**	**2.4700e-003**	**2.0000e-005**	**0.0536**	**0.0536**	**0.0000**	**0.0520**	**0.0520**	**0.0000**	**214.3880**	**214.3880**	**0.0351**	**0.0000**	**215.2644**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Brackney North: HDD (South entry) - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.2000e-004	0.0167	2.3700e-003	5.0000e-005	0.0112	1.3000e-004	0.0114	2.7900e-003	1.2000e-004	2.9100e-003	0.0000	4.6695	4.6695	1.3000e-004	7.4000e-004	4.8931
Vendor	1.0700e-003	0.0329	7.6300e-003	1.0000e-004	0.0265	3.1000e-004	0.0268	6.6200e-003	2.9000e-004	6.9100e-003	0.0000	9.4479	9.4479	1.9000e-004	1.4200e-003	9.8770
Worker	2.2900e-003	2.0100e-003	0.0215	5.0000e-005	0.0661	4.0000e-005	0.0661	0.0163	4.0000e-005	0.0164	0.0000	4.8543	4.8543	1.6000e-004	1.6000e-004	4.9048
Total	**3.6800e-003**	**0.0516**	**0.0315**	**2.0000e-004**	**0.1038**	**4.8000e-004**	**0.1043**	**0.0258**	**4.5000e-004**	**0.0262**	**0.0000**	**18.9716**	**18.9716**	**4.8000e-004**	**2.3200e-003**	**19.6749**

3.5 Brackney North: HDD (North entry) - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1179	1.0472	1.3500	2.4700e-003		0.0536	0.0536		0.0520	0.0520	0.0000	214.3883	214.3883	0.0351	0.0000	215.2646
Total	**0.1179**	**1.0472**	**1.3500**	**2.4700e-003**	**4.0000e-005**	**0.0536**	**0.0536**	**1.0000e-005**	**0.0520**	**0.0520**	**0.0000**	**214.3883**	**214.3883**	**0.0351**	**0.0000**	**215.2646**

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3.5 Brackney North: HDD (North entry) - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.2000e-004	0.0167	2.3700e-003	5.0000e-005	1.1200e-003	1.3000e-004	1.2400e-003	3.1000e-004	1.2000e-004	4.3000e-004	0.0000	4.6695	4.6695	1.3000e-004	7.4000e-004	4.8931
Vendor	1.0700e-003	0.0329	7.6300e-003	1.0000e-004	2.7900e-003	3.1000e-004	3.1000e-003	8.1000e-004	2.9000e-004	1.1000e-003	0.0000	9.4479	9.4479	1.9000e-004	1.4200e-003	9.8770
Worker	2.2900e-003	2.0100e-003	0.0215	5.0000e-005	5.8100e-003	4.0000e-005	5.8500e-003	1.5500e-003	4.0000e-005	1.5800e-003	0.0000	4.8543	4.8543	1.6000e-004	1.6000e-004	4.9048
Total	**3.6800e-003**	**0.0516**	**0.0315**	**2.0000e-004**	**9.7200e-003**	**4.8000e-004**	**0.0102**	**2.6700e-003**	**4.5000e-004**	**3.1100e-003**	**0.0000**	**18.9716**	**18.9716**	**4.8000e-004**	**2.3200e-003**	**19.6749**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1179	1.0472	1.3500	2.4700e-003		0.0536	0.0536		0.0520	0.0520	0.0000	214.3880	214.3880	0.0351	0.0000	215.2644
Total	**0.1179**	**1.0472**	**1.3500**	**2.4700e-003**	**2.0000e-005**	**0.0536**	**0.0536**	**0.0000**	**0.0520**	**0.0520**	**0.0000**	**214.3880**	**214.3880**	**0.0351**	**0.0000**	**215.2644**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Brackney North: HDD (North entry) - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.2000e-004	0.0167	2.3700e-003	5.0000e-005	1.1200e-003	1.3000e-004	1.2400e-003	3.1000e-004	1.2000e-004	4.3000e-004	0.0000	4.6695	4.6695	1.3000e-004	7.4000e-004	4.8931
Vendor	1.0700e-003	0.0329	7.6300e-003	1.0000e-004	2.7900e-003	3.1000e-004	3.1000e-003	8.1000e-004	2.9000e-004	1.1000e-003	0.0000	9.4479	9.4479	1.9000e-004	1.4200e-003	9.8770
Worker	2.2900e-003	2.0100e-003	0.0215	5.0000e-005	5.8100e-003	4.0000e-005	5.8500e-003	1.5500e-003	4.0000e-005	1.5800e-003	0.0000	4.8543	4.8543	1.6000e-004	1.6000e-004	4.9048
Total	**3.6800e-003**	**0.0516**	**0.0315**	**2.0000e-004**	**9.7200e-003**	**4.8000e-004**	**0.0102**	**2.6700e-003**	**4.5000e-004**	**3.1100e-003**	**0.0000**	**18.9716**	**18.9716**	**4.8000e-004**	**2.3200e-003**	**19.6749**

3.6 Brackney North: Carrier pipeline staging area prep - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0116	0.0853	0.1395	2.2000e-004		4.0100e-003	4.0100e-003		3.7700e-003	3.7700e-003	0.0000	18.6224	18.6224	5.3700e-003	0.0000	18.7566
Total	**0.0116**	**0.0853**	**0.1395**	**2.2000e-004**	**0.0000**	**4.0100e-003**	**4.0100e-003**	**0.0000**	**3.7700e-003**	**3.7700e-003**	**0.0000**	**18.6224**	**18.6224**	**5.3700e-003**	**0.0000**	**18.7566**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Brackney North: Carrier pipeline staging area prep - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0000e-005	2.1300e-003	3.0000e-004	1.0000e-005	1.4000e-004	2.0000e-005	1.6000e-004	4.0000e-005	2.0000e-005	5.0000e-005	0.0000	0.5969	0.5969	2.0000e-005	9.0000e-005	0.6254
Vendor	3.1000e-004	9.4900e-003	2.2000e-003	3.0000e-005	8.1000e-004	9.0000e-005	8.9000e-004	2.3000e-004	8.0000e-005	3.2000e-004	0.0000	2.7223	2.7223	5.0000e-005	4.1000e-004	2.8459
Worker	8.3000e-004	7.3000e-004	7.7500e-003	2.0000e-005	2.0900e-003	1.0000e-005	2.1100e-003	5.6000e-004	1.0000e-005	5.7000e-004	0.0000	1.7484	1.7484	6.0000e-005	6.0000e-005	1.7665
Total	**1.1800e-003**	**0.0124**	**0.0103**	**6.0000e-005**	**3.0400e-003**	**1.2000e-004**	**3.1600e-003**	**8.3000e-004**	**1.1000e-004**	**9.4000e-004**	**0.0000**	**5.0675**	**5.0675**	**1.3000e-004**	**5.6000e-004**	**5.2379**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0116	0.0853	0.1395	2.2000e-004		4.0100e-003	4.0100e-003		3.7700e-003	3.7700e-003	0.0000	18.6223	18.6223	5.3700e-003	0.0000	18.7566
Total	**0.0116**	**0.0853**	**0.1395**	**2.2000e-004**	**0.0000**	**4.0100e-003**	**4.0100e-003**	**0.0000**	**3.7700e-003**	**3.7700e-003**	**0.0000**	**18.6223**	**18.6223**	**5.3700e-003**	**0.0000**	**18.7566**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Brackney North: Carrier pipeline staging area prep - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0000e-005	2.1300e-003	3.0000e-004	1.0000e-005	1.4000e-004	2.0000e-005	1.6000e-004	4.0000e-005	2.0000e-005	5.0000e-005	0.0000	0.5969	0.5969	2.0000e-005	9.0000e-005	0.6254
Vendor	3.1000e-004	9.4900e-003	2.2000e-003	3.0000e-005	8.1000e-004	9.0000e-005	8.9000e-004	2.3000e-004	8.0000e-005	3.2000e-004	0.0000	2.7223	2.7223	5.0000e-005	4.1000e-004	2.8459
Worker	8.3000e-004	7.3000e-004	7.7500e-003	2.0000e-005	2.0900e-003	1.0000e-005	2.1100e-003	5.6000e-004	1.0000e-005	5.7000e-004	0.0000	1.7484	1.7484	6.0000e-005	6.0000e-005	1.7665
Total	**1.1800e-003**	**0.0124**	**0.0103**	**6.0000e-005**	**3.0400e-003**	**1.2000e-004**	**3.1600e-003**	**8.3000e-004**	**1.1000e-004**	**9.4000e-004**	**0.0000**	**5.0675**	**5.0675**	**1.3000e-004**	**5.6000e-004**	**5.2379**

3.7 Brackney North: HDD (pullback) - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0106	0.0931	0.1322	2.4000e-004		4.6400e-003	4.6400e-003		4.4700e-003	4.4700e-003	0.0000	20.7020	20.7020	4.1400e-003	0.0000	20.8055
Total	**0.0106**	**0.0931**	**0.1322**	**2.4000e-004**		**4.6400e-003**	**4.6400e-003**		**4.4700e-003**	**4.4700e-003**	**0.0000**	**20.7020**	**20.7020**	**4.1400e-003**	**0.0000**	**20.8055**

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3.7 Brackney North: HDD (pullback) - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	2.8800e-003	4.1000e-004	1.0000e-005	1.9000e-004	2.0000e-005	2.2000e-004	5.0000e-005	2.0000e-005	7.0000e-005	0.0000	0.8075	0.8075	2.0000e-005	1.3000e-004	0.8462
Vendor	2.0000e-005	5.6000e-004	1.3000e-004	0.0000	5.0000e-005	1.0000e-005	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.1601	0.1601	0.0000	2.0000e-005	0.1674
Worker	8.0000e-005	7.0000e-005	7.3000e-004	0.0000	2.0000e-004	0.0000	2.0000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1646	0.1646	1.0000e-005	1.0000e-005	0.1663
Total	**1.6000e-004**	**3.5100e-003**	**1.2700e-003**	**1.0000e-005**	**4.4000e-004**	**3.0000e-005**	**4.7000e-004**	**1.1000e-004**	**2.0000e-005**	**1.4000e-004**	**0.0000**	**1.1322**	**1.1322**	**3.0000e-005**	**1.6000e-004**	**1.1799**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0106	0.0931	0.1322	2.4000e-004		4.6400e-003	4.6400e-003		4.4700e-003	4.4700e-003	0.0000	20.7020	20.7020	4.1400e-003	0.0000	20.8055
Total	**0.0106**	**0.0931**	**0.1322**	**2.4000e-004**		**4.6400e-003**	**4.6400e-003**		**4.4700e-003**	**4.4700e-003**	**0.0000**	**20.7020**	**20.7020**	**4.1400e-003**	**0.0000**	**20.8055**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Brackney North: HDD (pullback) - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	2.8800e-003	4.1000e-004	1.0000e-005	1.9000e-004	2.0000e-005	2.2000e-004	5.0000e-005	2.0000e-005	7.0000e-005	0.0000	0.8075	0.8075	2.0000e-005	1.3000e-004	0.8462
Vendor	2.0000e-005	5.6000e-004	1.3000e-004	0.0000	5.0000e-005	1.0000e-005	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.1601	0.1601	0.0000	2.0000e-005	0.1674
Worker	8.0000e-005	7.0000e-005	7.3000e-004	0.0000	2.0000e-004	0.0000	2.0000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1646	0.1646	1.0000e-005	1.0000e-005	0.1663
Total	**1.6000e-004**	**3.5100e-003**	**1.2700e-003**	**1.0000e-005**	**4.4000e-004**	**3.0000e-005**	**4.7000e-004**	**1.1000e-004**	**2.0000e-005**	**1.4000e-004**	**0.0000**	**1.1322**	**1.1322**	**3.0000e-005**	**1.6000e-004**	**1.1799**

3.8 Brackney North: Tie-in pipeline construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6100e-003	0.0308	0.0428	7.0000e-005		1.5200e-003	1.5200e-003		1.4100e-003	1.4100e-003	0.0000	5.7512	5.7512	1.7300e-003	0.0000	5.7944
Total	**3.6100e-003**	**0.0308**	**0.0428**	**7.0000e-005**		**1.5200e-003**	**1.5200e-003**		**1.4100e-003**	**1.4100e-003**	**0.0000**	**5.7512**	**5.7512**	**1.7300e-003**	**0.0000**	**5.7944**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Brackney North: Tie-in pipeline construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.7000e-004	8.7700e-003	1.2500e-003	2.0000e-005	5.9000e-004	7.0000e-005	6.5000e-004	1.6000e-004	6.0000e-005	2.3000e-004	0.0000	2.4576	2.4576	7.0000e-005	3.9000e-004	2.5753
Vendor	1.3000e-004	3.9100e-003	9.1000e-004	1.0000e-005	3.3000e-004	4.0000e-005	3.7000e-004	1.0000e-004	3.0000e-005	1.3000e-004	0.0000	1.1209	1.1209	2.0000e-005	1.7000e-004	1.1719
Worker	2.7000e-004	2.4000e-004	2.5500e-003	1.0000e-005	6.9000e-004	0.0000	6.9000e-004	1.8000e-004	0.0000	1.9000e-004	0.0000	0.5759	0.5759	2.0000e-005	2.0000e-005	0.5819
Total	**5.7000e-004**	**0.0129**	**4.7100e-003**	**4.0000e-005**	**1.6100e-003**	**1.1000e-004**	**1.7100e-003**	**4.4000e-004**	**9.0000e-005**	**5.5000e-004**	**0.0000**	**4.1545**	**4.1545**	**1.1000e-004**	**5.8000e-004**	**4.3291**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6100e-003	0.0308	0.0428	7.0000e-005		1.5200e-003	1.5200e-003		1.4100e-003	1.4100e-003	0.0000	5.7512	5.7512	1.7300e-003	0.0000	5.7944
Total	**3.6100e-003**	**0.0308**	**0.0428**	**7.0000e-005**		**1.5200e-003**	**1.5200e-003**		**1.4100e-003**	**1.4100e-003**	**0.0000**	**5.7512**	**5.7512**	**1.7300e-003**	**0.0000**	**5.7944**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Brackney North: Tie-in pipeline construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.7000e-004	8.7700e-003	1.2500e-003	2.0000e-005	5.9000e-004	7.0000e-005	6.5000e-004	1.6000e-004	6.0000e-005	2.3000e-004	0.0000	2.4576	2.4576	7.0000e-005	3.9000e-004	2.5753
Vendor	1.3000e-004	3.9100e-003	9.1000e-004	1.0000e-005	3.3000e-004	4.0000e-005	3.7000e-004	1.0000e-004	3.0000e-005	1.3000e-004	0.0000	1.1209	1.1209	2.0000e-005	1.7000e-004	1.1719
Worker	2.7000e-004	2.4000e-004	2.5500e-003	1.0000e-005	6.9000e-004	0.0000	6.9000e-004	1.8000e-004	0.0000	1.9000e-004	0.0000	0.5759	0.5759	2.0000e-005	2.0000e-005	0.5819
Total	**5.7000e-004**	**0.0129**	**4.7100e-003**	**4.0000e-005**	**1.6100e-003**	**1.1000e-004**	**1.7100e-003**	**4.4000e-004**	**9.0000e-005**	**5.5000e-004**	**0.0000**	**4.1545**	**4.1545**	**1.1000e-004**	**5.8000e-004**	**4.3291**

3.8 Brackney North: Tie-in pipeline construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1200e-003	0.0766	0.1162	1.8000e-004		3.6700e-003	3.6700e-003		3.4200e-003	3.4200e-003	0.0000	15.6109	15.6109	4.6700e-003	0.0000	15.7275
Total	**9.1200e-003**	**0.0766**	**0.1162**	**1.8000e-004**		**3.6700e-003**	**3.6700e-003**		**3.4200e-003**	**3.4200e-003**	**0.0000**	**15.6109**	**15.6109**	**4.6700e-003**	**0.0000**	**15.7275**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Brackney North: Tie-in pipeline construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.9000e-004	0.0207	3.0800e-003	7.0000e-005	1.6000e-003	1.4000e-004	1.7300e-003	4.4000e-004	1.3000e-004	5.7000e-004	0.0000	6.4509	6.4509	1.8000e-004	1.0200e-003	6.7600
Vendor	2.1000e-004	9.0300e-003	2.1000e-003	3.0000e-005	9.0000e-004	5.0000e-005	9.5000e-004	2.6000e-004	5.0000e-005	3.1000e-004	0.0000	2.9431	2.9431	6.0000e-005	4.4000e-004	3.0765
Worker	6.9000e-004	5.7000e-004	6.3300e-003	2.0000e-005	1.8700e-003	1.0000e-005	1.8800e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.5167	1.5167	5.0000e-005	5.0000e-005	1.5315
Total	**1.1900e-003**	**0.0303**	**0.0115**	**1.2000e-004**	**4.3700e-003**	**2.0000e-004**	**4.5600e-003**	**1.2000e-003**	**1.9000e-004**	**1.3900e-003**	**0.0000**	**10.9107**	**10.9107**	**2.9000e-004**	**1.5100e-003**	**11.3681**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1200e-003	0.0766	0.1162	1.8000e-004		3.6700e-003	3.6700e-003		3.4200e-003	3.4200e-003	0.0000	15.6109	15.6109	4.6700e-003	0.0000	15.7275
Total	**9.1200e-003**	**0.0766**	**0.1162**	**1.8000e-004**		**3.6700e-003**	**3.6700e-003**		**3.4200e-003**	**3.4200e-003**	**0.0000**	**15.6109**	**15.6109**	**4.6700e-003**	**0.0000**	**15.7275**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Brackney North: Tie-in pipeline construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.9000e-004	0.0207	3.0800e-003	7.0000e-005	1.6000e-003	1.4000e-004	1.7300e-003	4.4000e-004	1.3000e-004	5.7000e-004	0.0000	6.4509	6.4509	1.8000e-004	1.0200e-003	6.7600
Vendor	2.1000e-004	9.0300e-003	2.1000e-003	3.0000e-005	9.0000e-004	5.0000e-005	9.5000e-004	2.6000e-004	5.0000e-005	3.1000e-004	0.0000	2.9431	2.9431	6.0000e-005	4.4000e-004	3.0765
Worker	6.9000e-004	5.7000e-004	6.3300e-003	2.0000e-005	1.8700e-003	1.0000e-005	1.8800e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.5167	1.5167	5.0000e-005	5.0000e-005	1.5315
Total	**1.1900e-003**	**0.0303**	**0.0115**	**1.2000e-004**	**4.3700e-003**	**2.0000e-004**	**4.5600e-003**	**1.2000e-003**	**1.9000e-004**	**1.3900e-003**	**0.0000**	**10.9107**	**10.9107**	**2.9000e-004**	**1.5100e-003**	**11.3681**

3.9 NCP FBPS to Graham Hill WTP: Staging area - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7400e-003	0.0539	0.0719	1.1000e-004		2.5800e-003	2.5800e-003		2.3900e-003	2.3900e-003	0.0000	9.1874	9.1874	2.7900e-003	0.0000	9.2572
Total	**5.7400e-003**	**0.0539**	**0.0719**	**1.1000e-004**	**0.0000**	**2.5800e-003**	**2.5800e-003**	**0.0000**	**2.3900e-003**	**2.3900e-003**	**0.0000**	**9.1874**	**9.1874**	**2.7900e-003**	**0.0000**	**9.2572**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.9 NCP FBPS to Graham Hill WTP: Staging area - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5000e-004	0.0109	2.5300e-003	4.0000e-005	1.0800e-003	6.0000e-005	1.1400e-003	3.1000e-004	6.0000e-005	3.7000e-004	0.0000	3.5434	3.5434	7.0000e-005	5.3000e-004	3.7040
Worker	8.3000e-004	6.9000e-004	7.6200e-003	2.0000e-005	2.2500e-003	1.0000e-005	2.2700e-003	6.0000e-004	1.0000e-005	6.1000e-004	0.0000	1.8260	1.8260	5.0000e-005	6.0000e-005	1.8439
Total	**1.0800e-003**	**0.0116**	**0.0102**	**6.0000e-005**	**3.3300e-003**	**7.0000e-005**	**3.4100e-003**	**9.1000e-004**	**7.0000e-005**	**9.8000e-004**	**0.0000**	**5.3693**	**5.3693**	**1.2000e-004**	**5.9000e-004**	**5.5478**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.7400e-003	0.0539	0.0719	1.1000e-004		2.5800e-003	2.5800e-003		2.3900e-003	2.3900e-003	0.0000	9.1874	9.1874	2.7900e-003	0.0000	9.2572
Total	**5.7400e-003**	**0.0539**	**0.0719**	**1.1000e-004**	**0.0000**	**2.5800e-003**	**2.5800e-003**	**0.0000**	**2.3900e-003**	**2.3900e-003**	**0.0000**	**9.1874**	**9.1874**	**2.7900e-003**	**0.0000**	**9.2572**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.9 NCP FBPS to Graham Hill WTP: Staging area - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5000e-004	0.0109	2.5300e-003	4.0000e-005	1.0800e-003	6.0000e-005	1.1400e-003	3.1000e-004	6.0000e-005	3.7000e-004	0.0000	3.5434	3.5434	7.0000e-005	5.3000e-004	3.7040
Worker	8.3000e-004	6.9000e-004	7.6200e-003	2.0000e-005	2.2500e-003	1.0000e-005	2.2700e-003	6.0000e-004	1.0000e-005	6.1000e-004	0.0000	1.8260	1.8260	5.0000e-005	6.0000e-005	1.8439
Total	**1.0800e-003**	**0.0116**	**0.0102**	**6.0000e-005**	**3.3300e-003**	**7.0000e-005**	**3.4100e-003**	**9.1000e-004**	**7.0000e-005**	**9.8000e-004**	**0.0000**	**5.3693**	**5.3693**	**1.2000e-004**	**5.9000e-004**	**5.5478**

3.10 Brackney North: Abandon existing pipeline - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.2600e-003	0.0361	0.0517	9.0000e-005		1.7300e-003	1.7300e-003		1.7000e-003	1.7000e-003	0.0000	7.5437	7.5437	9.6000e-004	0.0000	7.5678
Total	**4.2600e-003**	**0.0361**	**0.0517**	**9.0000e-005**		**1.7300e-003**	**1.7300e-003**		**1.7000e-003**	**1.7000e-003**	**0.0000**	**7.5437**	**7.5437**	**9.6000e-004**	**0.0000**	**7.5678**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.10 Brackney North: Abandon existing pipeline - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-004	6.9800e-003	1.0400e-003	2.0000e-005	5.4000e-004	5.0000e-005	5.8000e-004	1.5000e-004	4.0000e-005	1.9000e-004	0.0000	2.1730	2.1730	6.0000e-005	3.4000e-004	2.2771
Vendor	5.0000e-005	2.1400e-003	5.0000e-004	1.0000e-005	2.1000e-004	1.0000e-005	2.2000e-004	6.0000e-005	1.0000e-005	7.0000e-005	0.0000	0.6971	0.6971	1.0000e-005	1.0000e-004	0.7287
Worker	2.2000e-004	1.8000e-004	2.0000e-003	1.0000e-005	5.9000e-004	0.0000	5.9000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.4789	0.4789	1.0000e-005	1.0000e-005	0.4836
Total	**3.7000e-004**	**9.3000e-003**	**3.5400e-003**	**4.0000e-005**	**1.3400e-003**	**6.0000e-005**	**1.3900e-003**	**3.7000e-004**	**5.0000e-005**	**4.2000e-004**	**0.0000**	**3.3489**	**3.3489**	**8.0000e-005**	**4.5000e-004**	**3.4894**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.2600e-003	0.0361	0.0517	9.0000e-005		1.7300e-003	1.7300e-003		1.7000e-003	1.7000e-003	0.0000	7.5437	7.5437	9.6000e-004	0.0000	7.5677
Total	**4.2600e-003**	**0.0361**	**0.0517**	**9.0000e-005**		**1.7300e-003**	**1.7300e-003**		**1.7000e-003**	**1.7000e-003**	**0.0000**	**7.5437**	**7.5437**	**9.6000e-004**	**0.0000**	**7.5677**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.10 Brackney North: Abandon existing pipeline - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-004	6.9800e-003	1.0400e-003	2.0000e-005	5.4000e-004	5.0000e-005	5.8000e-004	1.5000e-004	4.0000e-005	1.9000e-004	0.0000	2.1730	2.1730	6.0000e-005	3.4000e-004	2.2771
Vendor	5.0000e-005	2.1400e-003	5.0000e-004	1.0000e-005	2.1000e-004	1.0000e-005	2.2000e-004	6.0000e-005	1.0000e-005	7.0000e-005	0.0000	0.6971	0.6971	1.0000e-005	1.0000e-004	0.7287
Worker	2.2000e-004	1.8000e-004	2.0000e-003	1.0000e-005	5.9000e-004	0.0000	5.9000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.4789	0.4789	1.0000e-005	1.0000e-005	0.4836
Total	**3.7000e-004**	**9.3000e-003**	**3.5400e-003**	**4.0000e-005**	**1.3400e-003**	**6.0000e-005**	**1.3900e-003**	**3.7000e-004**	**5.0000e-005**	**4.2000e-004**	**0.0000**	**3.3489**	**3.3489**	**8.0000e-005**	**4.5000e-004**	**3.4894**

3.11 Brackney North: Restoration - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0124	0.1113	0.1710	2.6000e-004		5.7500e-003	5.7500e-003		5.3600e-003	5.3600e-003	0.0000	22.5603	22.5603	6.4000e-003	0.0000	22.7202
Total	**0.0124**	**0.1113**	**0.1710**	**2.6000e-004**	**0.0000**	**5.7500e-003**	**5.7500e-003**	**0.0000**	**5.3600e-003**	**5.3600e-003**	**0.0000**	**22.5603**	**22.5603**	**6.4000e-003**	**0.0000**	**22.7202**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.11 Brackney North: Restoration - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.2000e-004	8.7200e-003	1.3000e-003	3.0000e-005	6.7000e-004	6.0000e-005	7.3000e-004	1.8000e-004	5.0000e-005	2.4000e-004	0.0000	2.7162	2.7162	8.0000e-005	4.3000e-004	2.8463
Vendor	1.6000e-004	7.1300e-003	1.6600e-003	2.0000e-005	7.1000e-004	4.0000e-005	7.5000e-004	2.1000e-004	4.0000e-005	2.4000e-004	0.0000	2.3235	2.3235	4.0000e-005	3.5000e-004	2.4288
Worker	7.2000e-004	6.0000e-004	6.6600e-003	2.0000e-005	1.9700e-003	1.0000e-005	1.9800e-003	5.2000e-004	1.0000e-005	5.4000e-004	0.0000	1.5965	1.5965	5.0000e-005	5.0000e-005	1.6121
Total	**1.0000e-003**	**0.0165**	**9.6200e-003**	**7.0000e-005**	**3.3500e-003**	**1.1000e-004**	**3.4600e-003**	**9.1000e-004**	**1.0000e-004**	**1.0200e-003**	**0.0000**	**6.6362**	**6.6362**	**1.7000e-004**	**8.3000e-004**	**6.8873**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0124	0.1113	0.1710	2.6000e-004		5.7500e-003	5.7500e-003		5.3600e-003	5.3600e-003	0.0000	22.5602	22.5602	6.4000e-003	0.0000	22.7202
Total	**0.0124**	**0.1113**	**0.1710**	**2.6000e-004**	**0.0000**	**5.7500e-003**	**5.7500e-003**	**0.0000**	**5.3600e-003**	**5.3600e-003**	**0.0000**	**22.5602**	**22.5602**	**6.4000e-003**	**0.0000**	**22.7202**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.11 Brackney North: Restoration - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.2000e-004	8.7200e-003	1.3000e-003	3.0000e-005	6.7000e-004	6.0000e-005	7.3000e-004	1.8000e-004	5.0000e-005	2.4000e-004	0.0000	2.7162	2.7162	8.0000e-005	4.3000e-004	2.8463
Vendor	1.6000e-004	7.1300e-003	1.6600e-003	2.0000e-005	7.1000e-004	4.0000e-005	7.5000e-004	2.1000e-004	4.0000e-005	2.4000e-004	0.0000	2.3235	2.3235	4.0000e-005	3.5000e-004	2.4288
Worker	7.2000e-004	6.0000e-004	6.6600e-003	2.0000e-005	1.9700e-003	1.0000e-005	1.9800e-003	5.2000e-004	1.0000e-005	5.4000e-004	0.0000	1.5965	1.5965	5.0000e-005	5.0000e-005	1.6121
Total	**1.0000e-003**	**0.0165**	**9.6200e-003**	**7.0000e-005**	**3.3500e-003**	**1.1000e-004**	**3.4600e-003**	**9.1000e-004**	**1.0000e-004**	**1.0200e-003**	**0.0000**	**6.6362**	**6.6362**	**1.7000e-004**	**8.3000e-004**	**6.8873**

3.12 Brackney North: Demobilization - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.4000e-003	0.0308	0.0549	8.0000e-005		1.5200e-003	1.5200e-003		1.3900e-003	1.3900e-003	0.0000	7.2727	7.2727	2.3500e-003	0.0000	7.3315
Total	**3.4000e-003**	**0.0308**	**0.0549**	**8.0000e-005**	**0.0000**	**1.5200e-003**	**1.5200e-003**	**0.0000**	**1.3900e-003**	**1.3900e-003**	**0.0000**	**7.2727**	**7.2727**	**2.3500e-003**	**0.0000**	**7.3315**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.12 Brackney North: Demobilization - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	4.3600e-003	6.5000e-004	1.0000e-005	3.4000e-004	3.0000e-005	3.6000e-004	9.0000e-005	3.0000e-005	1.2000e-004	0.0000	1.3581	1.3581	4.0000e-005	2.2000e-004	1.4232
Vendor	8.0000e-005	3.5700e-003	8.3000e-004	1.0000e-005	3.6000e-004	2.0000e-005	3.7000e-004	1.0000e-004	2.0000e-005	1.2000e-004	0.0000	1.1618	1.1618	2.0000e-005	1.7000e-004	1.2144
Worker	4.5000e-004	3.8000e-004	4.1600e-003	1.0000e-005	1.2300e-003	1.0000e-005	1.2400e-003	3.3000e-004	1.0000e-005	3.3000e-004	0.0000	0.9978	0.9978	3.0000e-005	3.0000e-005	1.0076
Total	**5.9000e-004**	**8.3100e-003**	**5.6400e-003**	**3.0000e-005**	**1.9300e-003**	**6.0000e-005**	**1.9700e-003**	**5.2000e-004**	**6.0000e-005**	**5.7000e-004**	**0.0000**	**3.5177**	**3.5177**	**9.0000e-005**	**4.2000e-004**	**3.6452**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.4000e-003	0.0308	0.0549	8.0000e-005		1.5200e-003	1.5200e-003		1.3900e-003	1.3900e-003	0.0000	7.2727	7.2727	2.3500e-003	0.0000	7.3315
Total	**3.4000e-003**	**0.0308**	**0.0549**	**8.0000e-005**	**0.0000**	**1.5200e-003**	**1.5200e-003**	**0.0000**	**1.3900e-003**	**1.3900e-003**	**0.0000**	**7.2727**	**7.2727**	**2.3500e-003**	**0.0000**	**7.3315**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.12 Brackney North: Demobilization - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-005	4.3600e-003	6.5000e-004	1.0000e-005	3.4000e-004	3.0000e-005	3.6000e-004	9.0000e-005	3.0000e-005	1.2000e-004	0.0000	1.3581	1.3581	4.0000e-005	2.2000e-004	1.4232
Vendor	8.0000e-005	3.5700e-003	8.3000e-004	1.0000e-005	3.6000e-004	2.0000e-005	3.7000e-004	1.0000e-004	2.0000e-005	1.2000e-004	0.0000	1.1618	1.1618	2.0000e-005	1.7000e-004	1.2144
Worker	4.5000e-004	3.8000e-004	4.1600e-003	1.0000e-005	1.2300e-003	1.0000e-005	1.2400e-003	3.3000e-004	1.0000e-005	3.3000e-004	0.0000	0.9978	0.9978	3.0000e-005	3.0000e-005	1.0076
Total	**5.9000e-004**	**8.3100e-003**	**5.6400e-003**	**3.0000e-005**	**1.9300e-003**	**6.0000e-005**	**1.9700e-003**	**5.2000e-004**	**6.0000e-005**	**5.7000e-004**	**0.0000**	**3.5177**	**3.5177**	**9.0000e-005**	**4.2000e-004**	**3.6452**

3.13 Big Trees RR Crossing: Shaft excavation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.6000e-004	5.0300e-003	8.7700e-003	1.0000e-005		2.3000e-004	2.3000e-004		2.2000e-004	2.2000e-004	0.0000	1.2724	1.2724	3.8000e-004	0.0000	1.2820
Total	**6.6000e-004**	**5.0300e-003**	**8.7700e-003**	**1.0000e-005**	**1.0000e-005**	**2.3000e-004**	**2.4000e-004**	**0.0000**	**2.2000e-004**	**2.2000e-004**	**0.0000**	**1.2724**	**1.2724**	**3.8000e-004**	**0.0000**	**1.2820**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.13 Big Trees RR Crossing: Shaft excavation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	3.6000e-003	5.3000e-004	1.0000e-005	2.8000e-004	2.0000e-005	3.0000e-004	8.0000e-005	2.0000e-005	1.0000e-004	0.0000	1.1204	1.1204	3.0000e-005	1.8000e-004	1.1741
Vendor	3.0000e-005	1.1900e-003	2.8000e-004	0.0000	1.2000e-004	1.0000e-005	1.2000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3873	0.3873	1.0000e-005	6.0000e-005	0.4048
Worker	5.0000e-005	4.0000e-005	4.2000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0998	0.0998	0.0000	0.0000	0.1008
Total	**1.3000e-004**	**4.8300e-003**	**1.2300e-003**	**1.0000e-005**	**5.2000e-004**	**3.0000e-005**	**5.4000e-004**	**1.4000e-004**	**3.0000e-005**	**1.7000e-004**	**0.0000**	**1.6075**	**1.6075**	**4.0000e-005**	**2.4000e-004**	**1.6797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.6000e-004	5.0300e-003	8.7700e-003	1.0000e-005		2.3000e-004	2.3000e-004		2.2000e-004	2.2000e-004	0.0000	1.2724	1.2724	3.8000e-004	0.0000	1.2820
Total	**6.6000e-004**	**5.0300e-003**	**8.7700e-003**	**1.0000e-005**	**0.0000**	**2.3000e-004**	**2.3000e-004**	**0.0000**	**2.2000e-004**	**2.2000e-004**	**0.0000**	**1.2724**	**1.2724**	**3.8000e-004**	**0.0000**	**1.2820**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.13 Big Trees RR Crossing: Shaft excavation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	3.6000e-003	5.3000e-004	1.0000e-005	2.8000e-004	2.0000e-005	3.0000e-004	8.0000e-005	2.0000e-005	1.0000e-004	0.0000	1.1204	1.1204	3.0000e-005	1.8000e-004	1.1741
Vendor	3.0000e-005	1.1900e-003	2.8000e-004	0.0000	1.2000e-004	1.0000e-005	1.2000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3873	0.3873	1.0000e-005	6.0000e-005	0.4048
Worker	5.0000e-005	4.0000e-005	4.2000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0998	0.0998	0.0000	0.0000	0.1008
Total	**1.3000e-004**	**4.8300e-003**	**1.2300e-003**	**1.0000e-005**	**5.2000e-004**	**3.0000e-005**	**5.4000e-004**	**1.4000e-004**	**3.0000e-005**	**1.7000e-004**	**0.0000**	**1.6075**	**1.6075**	**4.0000e-005**	**2.4000e-004**	**1.6797**

3.14 Big Trees RR Crossing: Boring and casing - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.0800e-003	0.0102	0.0102	5.0000e-005		3.3000e-004	3.3000e-004		3.0000e-004	3.0000e-004	0.0000	4.1522	4.1522	1.3400e-003	0.0000	4.1858
Total	**1.0800e-003**	**0.0102**	**0.0102**	**5.0000e-005**		**3.3000e-004**	**3.3000e-004**		**3.0000e-004**	**3.0000e-004**	**0.0000**	**4.1522**	**4.1522**	**1.3400e-003**	**0.0000**	**4.1858**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.14 Big Trees RR Crossing: Boring and casing - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	5.9000e-004	1.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1936	0.1936	0.0000	3.0000e-005	0.2024
Worker	5.0000e-005	4.0000e-005	4.2000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0998	0.0998	0.0000	0.0000	0.1008
Total	**6.0000e-005**	**6.3000e-004**	**5.6000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.2934**	**0.2934**	**0.0000**	**3.0000e-005**	**0.3032**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.0800e-003	0.0102	0.0102	5.0000e-005		3.3000e-004	3.3000e-004		3.0000e-004	3.0000e-004	0.0000	4.1522	4.1522	1.3400e-003	0.0000	4.1858
Total	**1.0800e-003**	**0.0102**	**0.0102**	**5.0000e-005**		**3.3000e-004**	**3.3000e-004**		**3.0000e-004**	**3.0000e-004**	**0.0000**	**4.1522**	**4.1522**	**1.3400e-003**	**0.0000**	**4.1858**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.14 Big Trees RR Crossing: Boring and casing - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	5.9000e-004	1.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1936	0.1936	0.0000	3.0000e-005	0.2024
Worker	5.0000e-005	4.0000e-005	4.2000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0998	0.0998	0.0000	0.0000	0.1008
Total	**6.0000e-005**	**6.3000e-004**	**5.6000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.2934**	**0.2934**	**0.0000**	**3.0000e-005**	**0.3032**

3.15 Big Trees RR Crossing: Pipe install - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.8000e-004	3.8400e-003	5.5800e-003	1.0000e-005		1.9000e-004	1.9000e-004		1.7000e-004	1.7000e-004	0.0000	0.6840	0.6840	2.2000e-004	0.0000	0.6895
Total	**3.8000e-004**	**3.8400e-003**	**5.5800e-003**	**1.0000e-005**		**1.9000e-004**	**1.9000e-004**		**1.7000e-004**	**1.7000e-004**	**0.0000**	**0.6840**	**0.6840**	**2.2000e-004**	**0.0000**	**0.6895**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.15 Big Trees RR Crossing: Pipe install - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	3.0000e-004	7.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0968	0.0968	0.0000	1.0000e-005	0.1012
Worker	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0499	0.0499	0.0000	0.0000	0.0504
Total	**3.0000e-005**	**3.2000e-004**	**2.8000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1467**	**0.1467**	**0.0000**	**1.0000e-005**	**0.1516**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.8000e-004	3.8400e-003	5.5800e-003	1.0000e-005		1.9000e-004	1.9000e-004		1.7000e-004	1.7000e-004	0.0000	0.6840	0.6840	2.2000e-004	0.0000	0.6895
Total	**3.8000e-004**	**3.8400e-003**	**5.5800e-003**	**1.0000e-005**		**1.9000e-004**	**1.9000e-004**		**1.7000e-004**	**1.7000e-004**	**0.0000**	**0.6840**	**0.6840**	**2.2000e-004**	**0.0000**	**0.6895**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.15 Big Trees RR Crossing: Pipe install - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	3.0000e-004	7.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0968	0.0968	0.0000	1.0000e-005	0.1012
Worker	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0499	0.0499	0.0000	0.0000	0.0504
Total	**3.0000e-005**	**3.2000e-004**	**2.8000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1467**	**0.1467**	**0.0000**	**1.0000e-005**	**0.1516**

3.16 Big Trees RR Crossing: Grout - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5000e-004	9.2000e-004	7.7000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.1146	0.1146	1.0000e-005	0.0000	0.1149
Total	**1.5000e-004**	**9.2000e-004**	**7.7000e-004**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**0.1146**	**0.1146**	**1.0000e-005**	**0.0000**	**0.1149**

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3.16 Big Trees RR Crossing: Grout - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	1.0900e-003	1.6000e-004	0.0000	8.0000e-005	1.0000e-005	9.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.3395	0.3395	1.0000e-005	5.0000e-005	0.3558
Vendor	1.0000e-005	3.0000e-004	7.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0968	0.0968	0.0000	1.0000e-005	0.1012
Worker	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0499	0.0499	0.0000	0.0000	0.0504
Total	**5.0000e-005**	**1.4100e-003**	**4.4000e-004**	**0.0000**	**1.7000e-004**	**1.0000e-005**	**1.8000e-004**	**5.0000e-005**	**1.0000e-005**	**6.0000e-005**	**0.0000**	**0.4862**	**0.4862**	**1.0000e-005**	**6.0000e-005**	**0.5074**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5000e-004	9.2000e-004	7.7000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.1146	0.1146	1.0000e-005	0.0000	0.1149
Total	**1.5000e-004**	**9.2000e-004**	**7.7000e-004**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**0.1146**	**0.1146**	**1.0000e-005**	**0.0000**	**0.1149**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.16 Big Trees RR Crossing: Grout - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	1.0900e-003	1.6000e-004	0.0000	8.0000e-005	1.0000e-005	9.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.3395	0.3395	1.0000e-005	5.0000e-005	0.3558
Vendor	1.0000e-005	3.0000e-004	7.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0968	0.0968	0.0000	1.0000e-005	0.1012
Worker	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0499	0.0499	0.0000	0.0000	0.0504
Total	**5.0000e-005**	**1.4100e-003**	**4.4000e-004**	**0.0000**	**1.7000e-004**	**1.0000e-005**	**1.8000e-004**	**5.0000e-005**	**1.0000e-005**	**6.0000e-005**	**0.0000**	**0.4862**	**0.4862**	**1.0000e-005**	**6.0000e-005**	**0.5074**

3.17 Big Trees RR Crossing: Backfill - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.17 Big Trees RR Crossing: Backfill - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	5.9000e-004	1.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1936	0.1936	0.0000	3.0000e-005	0.2024
Worker	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0499	0.0499	0.0000	0.0000	0.0504
Total	**3.0000e-005**	**6.1000e-004**	**3.5000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.2435**	**0.2435**	**0.0000**	**3.0000e-005**	**0.2528**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.17 Big Trees RR Crossing: Backfill - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	5.9000e-004	1.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1936	0.1936	0.0000	3.0000e-005	0.2024
Worker	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0499	0.0499	0.0000	0.0000	0.0504
Total	**3.0000e-005**	**6.1000e-004**	**3.5000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.2435**	**0.2435**	**0.0000**	**3.0000e-005**	**0.2528**

3.18 Zayante Creek Crossing: CIDH Piles - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3700e-003	0.0120	0.0117	5.0000e-005		4.0000e-004	4.0000e-004		3.8000e-004	3.8000e-004	0.0000	4.3813	4.3813	1.3700e-003	0.0000	4.4155
Total	**1.3700e-003**	**0.0120**	**0.0117**	**5.0000e-005**		**4.0000e-004**	**4.0000e-004**		**3.8000e-004**	**3.8000e-004**	**0.0000**	**4.3813**	**4.3813**	**1.3700e-003**	**0.0000**	**4.4155**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.18 Zayante Creek Crossing: CIDH Piles - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	1.3100e-003	1.9000e-004	0.0000	1.0000e-004	1.0000e-005	1.1000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.4074	0.4074	1.0000e-005	6.0000e-005	0.4270
Vendor	3.0000e-005	1.1900e-003	2.8000e-004	0.0000	1.2000e-004	1.0000e-005	1.2000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3873	0.3873	1.0000e-005	6.0000e-005	0.4048
Worker	1.8000e-004	1.5000e-004	1.6700e-003	0.0000	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3991	0.3991	1.0000e-005	1.0000e-005	0.4030
Total	**2.3000e-004**	**2.6500e-003**	**2.1400e-003**	**0.0000**	**7.1000e-004**	**2.0000e-005**	**7.3000e-004**	**1.9000e-004**	**2.0000e-005**	**2.1000e-004**	**0.0000**	**1.1938**	**1.1938**	**3.0000e-005**	**1.3000e-004**	**1.2348**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3700e-003	0.0120	0.0117	5.0000e-005		4.0000e-004	4.0000e-004		3.8000e-004	3.8000e-004	0.0000	4.3813	4.3813	1.3700e-003	0.0000	4.4155
Total	**1.3700e-003**	**0.0120**	**0.0117**	**5.0000e-005**		**4.0000e-004**	**4.0000e-004**		**3.8000e-004**	**3.8000e-004**	**0.0000**	**4.3813**	**4.3813**	**1.3700e-003**	**0.0000**	**4.4155**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.18 Zayante Creek Crossing: CIDH Piles - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	1.3100e-003	1.9000e-004	0.0000	1.0000e-004	1.0000e-005	1.1000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.4074	0.4074	1.0000e-005	6.0000e-005	0.4270
Vendor	3.0000e-005	1.1900e-003	2.8000e-004	0.0000	1.2000e-004	1.0000e-005	1.2000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.3873	0.3873	1.0000e-005	6.0000e-005	0.4048
Worker	1.8000e-004	1.5000e-004	1.6700e-003	0.0000	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3991	0.3991	1.0000e-005	1.0000e-005	0.4030
Total	**2.3000e-004**	**2.6500e-003**	**2.1400e-003**	**0.0000**	**7.1000e-004**	**2.0000e-005**	**7.3000e-004**	**1.9000e-004**	**2.0000e-005**	**2.1000e-004**	**0.0000**	**1.1938**	**1.1938**	**3.0000e-005**	**1.3000e-004**	**1.2348**

3.19 Zayante Creek Crossing: Pier scour protect - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.3000e-004	5.9800e-003	8.1400e-003	1.0000e-005		2.9000e-004	2.9000e-004		2.7000e-004	2.7000e-004	0.0000	1.0301	1.0301	3.2000e-004	0.0000	1.0381
Total	**6.3000e-004**	**5.9800e-003**	**8.1400e-003**	**1.0000e-005**		**2.9000e-004**	**2.9000e-004**		**2.7000e-004**	**2.7000e-004**	**0.0000**	**1.0301**	**1.0301**	**3.2000e-004**	**0.0000**	**1.0381**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.19 Zayante Creek Crossing: Pier scour protect - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.0000e-005	4.8100e-003	7.1000e-004	2.0000e-005	3.7000e-004	3.0000e-005	4.0000e-004	1.0000e-004	3.0000e-005	1.3000e-004	0.0000	1.4973	1.4973	4.0000e-005	2.4000e-004	1.5690
Vendor	3.0000e-005	1.2500e-003	2.9000e-004	0.0000	1.2000e-004	1.0000e-005	1.3000e-004	4.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.4066	0.4066	1.0000e-005	6.0000e-005	0.4251
Worker	1.0000e-004	8.0000e-005	8.7000e-004	0.0000	2.6000e-004	0.0000	2.6000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2095	0.2095	1.0000e-005	1.0000e-005	0.2116
Total	**2.0000e-004**	**6.1400e-003**	**1.8700e-003**	**2.0000e-005**	**7.5000e-004**	**4.0000e-005**	**7.9000e-004**	**2.1000e-004**	**4.0000e-005**	**2.4000e-004**	**0.0000**	**2.1135**	**2.1135**	**6.0000e-005**	**3.1000e-004**	**2.2057**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.3000e-004	5.9800e-003	8.1400e-003	1.0000e-005		2.9000e-004	2.9000e-004		2.7000e-004	2.7000e-004	0.0000	1.0301	1.0301	3.2000e-004	0.0000	1.0381
Total	**6.3000e-004**	**5.9800e-003**	**8.1400e-003**	**1.0000e-005**		**2.9000e-004**	**2.9000e-004**		**2.7000e-004**	**2.7000e-004**	**0.0000**	**1.0301**	**1.0301**	**3.2000e-004**	**0.0000**	**1.0381**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.19 Zayante Creek Crossing: Pier scour protect - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.0000e-005	4.8100e-003	7.1000e-004	2.0000e-005	3.7000e-004	3.0000e-005	4.0000e-004	1.0000e-004	3.0000e-005	1.3000e-004	0.0000	1.4973	1.4973	4.0000e-005	2.4000e-004	1.5690
Vendor	3.0000e-005	1.2500e-003	2.9000e-004	0.0000	1.2000e-004	1.0000e-005	1.3000e-004	4.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.4066	0.4066	1.0000e-005	6.0000e-005	0.4251
Worker	1.0000e-004	8.0000e-005	8.7000e-004	0.0000	2.6000e-004	0.0000	2.6000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.2095	0.2095	1.0000e-005	1.0000e-005	0.2116
Total	**2.0000e-004**	**6.1400e-003**	**1.8700e-003**	**2.0000e-005**	**7.5000e-004**	**4.0000e-005**	**7.9000e-004**	**2.1000e-004**	**4.0000e-005**	**2.4000e-004**	**0.0000**	**2.1135**	**2.1135**	**6.0000e-005**	**3.1000e-004**	**2.2057**

3.20 Zayante Creek Crossing: Pipe support - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.0000e-004	5.5300e-003	6.1200e-003	1.0000e-005		2.4000e-004	2.4000e-004		2.4000e-004	2.4000e-004	0.0000	0.9043	0.9043	6.0000e-005	0.0000	0.9059
Total	**8.0000e-004**	**5.5300e-003**	**6.1200e-003**	**1.0000e-005**		**2.4000e-004**	**2.4000e-004**		**2.4000e-004**	**2.4000e-004**	**0.0000**	**0.9043**	**0.9043**	**6.0000e-005**	**0.0000**	**0.9059**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.20 Zayante Creek Crossing: Pipe support - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	3.4900e-003	5.2000e-004	1.0000e-005	2.7000e-004	2.0000e-005	2.9000e-004	7.0000e-005	2.0000e-005	1.0000e-004	0.0000	1.0865	1.0865	3.0000e-005	1.7000e-004	1.1385
Vendor	2.0000e-005	9.5000e-004	2.2000e-004	0.0000	9.0000e-005	1.0000e-005	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.3098	0.3098	1.0000e-005	5.0000e-005	0.3239
Worker	2.9000e-004	2.4000e-004	2.6600e-003	1.0000e-005	7.9000e-004	1.0000e-005	7.9000e-004	2.1000e-004	0.0000	2.1000e-004	0.0000	0.6386	0.6386	2.0000e-005	2.0000e-005	0.6449
Total	**3.6000e-004**	**4.6800e-003**	**3.4000e-003**	**2.0000e-005**	**1.1500e-003**	**4.0000e-005**	**1.1800e-003**	**3.1000e-004**	**2.0000e-005**	**3.4000e-004**	**0.0000**	**2.0349**	**2.0349**	**6.0000e-005**	**2.4000e-004**	**2.1072**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.0000e-004	5.5300e-003	6.1200e-003	1.0000e-005		2.4000e-004	2.4000e-004		2.4000e-004	2.4000e-004	0.0000	0.9043	0.9043	6.0000e-005	0.0000	0.9059
Total	**8.0000e-004**	**5.5300e-003**	**6.1200e-003**	**1.0000e-005**		**2.4000e-004**	**2.4000e-004**		**2.4000e-004**	**2.4000e-004**	**0.0000**	**0.9043**	**0.9043**	**6.0000e-005**	**0.0000**	**0.9059**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.20 Zayante Creek Crossing: Pipe support - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	3.4900e-003	5.2000e-004	1.0000e-005	2.7000e-004	2.0000e-005	2.9000e-004	7.0000e-005	2.0000e-005	1.0000e-004	0.0000	1.0865	1.0865	3.0000e-005	1.7000e-004	1.1385
Vendor	2.0000e-005	9.5000e-004	2.2000e-004	0.0000	9.0000e-005	1.0000e-005	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.3098	0.3098	1.0000e-005	5.0000e-005	0.3239
Worker	2.9000e-004	2.4000e-004	2.6600e-003	1.0000e-005	7.9000e-004	1.0000e-005	7.9000e-004	2.1000e-004	0.0000	2.1000e-004	0.0000	0.6386	0.6386	2.0000e-005	2.0000e-005	0.6449
Total	**3.6000e-004**	**4.6800e-003**	**3.4000e-003**	**2.0000e-005**	**1.1500e-003**	**4.0000e-005**	**1.1800e-003**	**3.1000e-004**	**2.0000e-005**	**3.4000e-004**	**0.0000**	**2.0349**	**2.0349**	**6.0000e-005**	**2.4000e-004**	**2.1072**

3.21 Zayante Creek Crossing: Install pipe span - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.6400e-003	0.0286	0.0138	4.0000e-005		1.2000e-003	1.2000e-003		1.1000e-003	1.1000e-003	0.0000	3.8021	3.8021	1.2300e-003	0.0000	3.8329
Total	**2.6400e-003**	**0.0286**	**0.0138**	**4.0000e-005**		**1.2000e-003**	**1.2000e-003**		**1.1000e-003**	**1.1000e-003**	**0.0000**	**3.8021**	**3.8021**	**1.2300e-003**	**0.0000**	**3.8329**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.21 Zayante Creek Crossing: Install pipe span - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	8.9000e-004	2.1000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	3.0000e-005	0.0000	3.0000e-005	0.0000	0.2904	0.2904	1.0000e-005	4.0000e-005	0.3036
Worker	7.0000e-005	6.0000e-005	6.2000e-004	0.0000	1.8000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1497	0.1497	0.0000	0.0000	0.1511
Total	**9.0000e-005**	**9.5000e-004**	**8.3000e-004**	**0.0000**	**2.7000e-004**	**0.0000**	**2.8000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.4401**	**0.4401**	**1.0000e-005**	**4.0000e-005**	**0.4548**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.6400e-003	0.0286	0.0138	4.0000e-005		1.2000e-003	1.2000e-003		1.1000e-003	1.1000e-003	0.0000	3.8021	3.8021	1.2300e-003	0.0000	3.8329
Total	**2.6400e-003**	**0.0286**	**0.0138**	**4.0000e-005**		**1.2000e-003**	**1.2000e-003**		**1.1000e-003**	**1.1000e-003**	**0.0000**	**3.8021**	**3.8021**	**1.2300e-003**	**0.0000**	**3.8329**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.21 Zayante Creek Crossing: Install pipe span - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	8.9000e-004	2.1000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	3.0000e-005	0.0000	3.0000e-005	0.0000	0.2904	0.2904	1.0000e-005	4.0000e-005	0.3036
Worker	7.0000e-005	6.0000e-005	6.2000e-004	0.0000	1.8000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1497	0.1497	0.0000	0.0000	0.1511
Total	**9.0000e-005**	**9.5000e-004**	**8.3000e-004**	**0.0000**	**2.7000e-004**	**0.0000**	**2.8000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.4401**	**0.4401**	**1.0000e-005**	**4.0000e-005**	**0.4548**

3.22 Zayante Creek Crossing: Install flex connect - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.8000e-004	3.8400e-003	5.5800e-003	1.0000e-005		1.9000e-004	1.9000e-004		1.7000e-004	1.7000e-004	0.0000	0.6840	0.6840	2.2000e-004	0.0000	0.6895
Total	**3.8000e-004**	**3.8400e-003**	**5.5800e-003**	**1.0000e-005**		**1.9000e-004**	**1.9000e-004**		**1.7000e-004**	**1.7000e-004**	**0.0000**	**0.6840**	**0.6840**	**2.2000e-004**	**0.0000**	**0.6895**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.22 Zayante Creek Crossing: Install flex connect - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	5.9000e-004	1.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1936	0.1936	0.0000	3.0000e-005	0.2024
Worker	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0499	0.0499	0.0000	0.0000	0.0504
Total	**3.0000e-005**	**6.1000e-004**	**3.5000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.2435**	**0.2435**	**0.0000**	**3.0000e-005**	**0.2528**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.8000e-004	3.8400e-003	5.5800e-003	1.0000e-005		1.9000e-004	1.9000e-004		1.7000e-004	1.7000e-004	0.0000	0.6840	0.6840	2.2000e-004	0.0000	0.6895
Total	**3.8000e-004**	**3.8400e-003**	**5.5800e-003**	**1.0000e-005**		**1.9000e-004**	**1.9000e-004**		**1.7000e-004**	**1.7000e-004**	**0.0000**	**0.6840**	**0.6840**	**2.2000e-004**	**0.0000**	**0.6895**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.22 Zayante Creek Crossing: Install flex connect - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	5.9000e-004	1.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1936	0.1936	0.0000	3.0000e-005	0.2024
Worker	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0499	0.0499	0.0000	0.0000	0.0504
Total	**3.0000e-005**	**6.1000e-004**	**3.5000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.2435**	**0.2435**	**0.0000**	**3.0000e-005**	**0.2528**

3.23 Zayante Creek Crossing: Grade for drainage - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.8000e-004	3.8400e-003	5.5800e-003	1.0000e-005		1.9000e-004	1.9000e-004		1.7000e-004	1.7000e-004	0.0000	0.6840	0.6840	2.2000e-004	0.0000	0.6895
Total	**3.8000e-004**	**3.8400e-003**	**5.5800e-003**	**1.0000e-005**	**0.0000**	**1.9000e-004**	**1.9000e-004**	**0.0000**	**1.7000e-004**	**1.7000e-004**	**0.0000**	**0.6840**	**0.6840**	**2.2000e-004**	**0.0000**	**0.6895**

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3.23 Zayante Creek Crossing: Grade for drainage - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	3.0000e-004	7.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0968	0.0968	0.0000	1.0000e-005	0.1012
Worker	7.0000e-005	6.0000e-005	6.2000e-004	0.0000	1.8000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1497	0.1497	0.0000	0.0000	0.1511
Total	**8.0000e-005**	**3.6000e-004**	**6.9000e-004**	**0.0000**	**2.1000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.2465**	**0.2465**	**0.0000**	**1.0000e-005**	**0.2523**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.8000e-004	3.8400e-003	5.5800e-003	1.0000e-005		1.9000e-004	1.9000e-004		1.7000e-004	1.7000e-004	0.0000	0.6840	0.6840	2.2000e-004	0.0000	0.6895
Total	**3.8000e-004**	**3.8400e-003**	**5.5800e-003**	**1.0000e-005**	**0.0000**	**1.9000e-004**	**1.9000e-004**	**0.0000**	**1.7000e-004**	**1.7000e-004**	**0.0000**	**0.6840**	**0.6840**	**2.2000e-004**	**0.0000**	**0.6895**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.23 Zayante Creek Crossing: Grade for drainage - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	3.0000e-004	7.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0968	0.0968	0.0000	1.0000e-005	0.1012
Worker	7.0000e-005	6.0000e-005	6.2000e-004	0.0000	1.8000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1497	0.1497	0.0000	0.0000	0.1511
Total	**8.0000e-005**	**3.6000e-004**	**6.9000e-004**	**0.0000**	**2.1000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.2465**	**0.2465**	**0.0000**	**1.0000e-005**	**0.2523**

3.24 FBPS to Zayante: Road removal/pipe install - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.8000e-004	0.0000	1.8000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9100e-003	0.0159	0.0273	4.0000e-005		7.6000e-004	7.6000e-004		7.1000e-004	7.1000e-004	0.0000	3.8034	3.8034	1.0500e-003	0.0000	3.8298
Total	**1.9100e-003**	**0.0159**	**0.0273**	**4.0000e-005**	**1.8000e-004**	**7.6000e-004**	**9.4000e-004**	**3.0000e-005**	**7.1000e-004**	**7.4000e-004**	**0.0000**	**3.8034**	**3.8034**	**1.0500e-003**	**0.0000**	**3.8298**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.24 FBPS to Zayante: Road removal/pipe install - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.2500e-003	0.0885	0.0132	2.8000e-004	6.8200e-003	5.8000e-004	7.4000e-003	1.8700e-003	5.6000e-004	2.4300e-003	0.0000	27.5693	27.5693	7.8000e-004	4.3700e-003	28.8903
Vendor	5.9000e-004	0.0259	6.0200e-003	9.0000e-005	2.5800e-003	1.4000e-004	2.7200e-003	7.4000e-004	1.4000e-004	8.8000e-004	0.0000	8.4227	8.4227	1.6000e-004	1.2700e-003	8.8046
Worker	1.0900e-003	9.0000e-004	9.9900e-003	3.0000e-005	2.9500e-003	2.0000e-005	2.9700e-003	7.9000e-004	2.0000e-005	8.0000e-004	0.0000	2.3947	2.3947	7.0000e-005	7.0000e-005	2.4182
Total	**2.9300e-003**	**0.1153**	**0.0292**	**4.0000e-004**	**0.0124**	**7.4000e-004**	**0.0131**	**3.4000e-003**	**7.2000e-004**	**4.1100e-003**	**0.0000**	**38.3867**	**38.3867**	**1.0100e-003**	**5.7100e-003**	**40.1130**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.0000e-005	0.0000	8.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9100e-003	0.0159	0.0273	4.0000e-005		7.6000e-004	7.6000e-004		7.1000e-004	7.1000e-004	0.0000	3.8034	3.8034	1.0500e-003	0.0000	3.8298
Total	**1.9100e-003**	**0.0159**	**0.0273**	**4.0000e-005**	**8.0000e-005**	**7.6000e-004**	**8.4000e-004**	**1.0000e-005**	**7.1000e-004**	**7.2000e-004**	**0.0000**	**3.8034**	**3.8034**	**1.0500e-003**	**0.0000**	**3.8298**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.24 FBPS to Zayante: Road removal/pipe install - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.2500e-003	0.0885	0.0132	2.8000e-004	6.8200e-003	5.8000e-004	7.4000e-003	1.8700e-003	5.6000e-004	2.4300e-003	0.0000	27.5693	27.5693	7.8000e-004	4.3700e-003	28.8903
Vendor	5.9000e-004	0.0259	6.0200e-003	9.0000e-005	2.5800e-003	1.4000e-004	2.7200e-003	7.4000e-004	1.4000e-004	8.8000e-004	0.0000	8.4227	8.4227	1.6000e-004	1.2700e-003	8.8046
Worker	1.0900e-003	9.0000e-004	9.9900e-003	3.0000e-005	2.9500e-003	2.0000e-005	2.9700e-003	7.9000e-004	2.0000e-005	8.0000e-004	0.0000	2.3947	2.3947	7.0000e-005	7.0000e-005	2.4182
Total	**2.9300e-003**	**0.1153**	**0.0292**	**4.0000e-004**	**0.0124**	**7.4000e-004**	**0.0131**	**3.4000e-003**	**7.2000e-004**	**4.1100e-003**	**0.0000**	**38.3867**	**38.3867**	**1.0100e-003**	**5.7100e-003**	**40.1130**

3.25 Zayante to Big Trees RR: Road removal/pipe install - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.2000e-004	0.0000	6.2000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.0800e-003	0.0338	0.0583	9.0000e-005		1.6200e-003	1.6200e-003		1.5200e-003	1.5200e-003	0.0000	8.1140	8.1140	2.2500e-003	0.0000	8.1702
Total	**4.0800e-003**	**0.0338**	**0.0583**	**9.0000e-005**	**6.2000e-004**	**1.6200e-003**	**2.2400e-003**	**8.0000e-005**	**1.5200e-003**	**1.6000e-003**	**0.0000**	**8.1140**	**8.1140**	**2.2500e-003**	**0.0000**	**8.1702**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.25 Zayante to Big Trees RR: Road removal/pipe install - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0000e-003	0.2834	0.0421	8.9000e-004	0.0218	1.8600e-003	0.0237	5.9900e-003	1.7800e-003	7.7700e-003	0.0000	88.2578	88.2578	2.5000e-003	0.0140	92.4868
Vendor	1.8500e-003	0.0808	0.0188	2.7000e-004	8.0500e-003	4.4000e-004	8.5000e-003	2.3300e-003	4.2000e-004	2.7500e-003	0.0000	26.3332	26.3332	5.0000e-004	3.9600e-003	27.5269
Worker	2.6100e-003	2.1600e-003	0.0240	6.0000e-005	7.0900e-003	5.0000e-005	7.1400e-003	1.8900e-003	4.0000e-005	1.9300e-003	0.0000	5.7473	5.7473	1.7000e-004	1.7000e-004	5.8036
Total	**8.4600e-003**	**0.3664**	**0.0849**	**1.2200e-003**	**0.0370**	**2.3500e-003**	**0.0393**	**0.0102**	**2.2400e-003**	**0.0125**	**0.0000**	**120.3383**	**120.3383**	**3.1700e-003**	**0.0181**	**125.8173**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.8000e-004	0.0000	2.8000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.0800e-003	0.0338	0.0583	9.0000e-005		1.6200e-003	1.6200e-003		1.5200e-003	1.5200e-003	0.0000	8.1140	8.1140	2.2500e-003	0.0000	8.1702
Total	**4.0800e-003**	**0.0338**	**0.0583**	**9.0000e-005**	**2.8000e-004**	**1.6200e-003**	**1.9000e-003**	**4.0000e-005**	**1.5200e-003**	**1.5600e-003**	**0.0000**	**8.1140**	**8.1140**	**2.2500e-003**	**0.0000**	**8.1702**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.25 Zayante to Big Trees RR: Road removal/pipe install - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0000e-003	0.2834	0.0421	8.9000e-004	0.0218	1.8600e-003	0.0237	5.9900e-003	1.7800e-003	7.7700e-003	0.0000	88.2578	88.2578	2.5000e-003	0.0140	92.4868
Vendor	1.8500e-003	0.0808	0.0188	2.7000e-004	8.0500e-003	4.4000e-004	8.5000e-003	2.3300e-003	4.2000e-004	2.7500e-003	0.0000	26.3332	26.3332	5.0000e-004	3.9600e-003	27.5269
Worker	2.6100e-003	2.1600e-003	0.0240	6.0000e-005	7.0900e-003	5.0000e-005	7.1400e-003	1.8900e-003	4.0000e-005	1.9300e-003	0.0000	5.7473	5.7473	1.7000e-004	1.7000e-004	5.8036
Total	**8.4600e-003**	**0.3664**	**0.0849**	**1.2200e-003**	**0.0370**	**2.3500e-003**	**0.0393**	**0.0102**	**2.2400e-003**	**0.0125**	**0.0000**	**120.3383**	**120.3383**	**3.1700e-003**	**0.0181**	**125.8173**

3.26 GH Rd North: Road removal/pipe install - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.3700e-003	0.0000	4.3700e-003	5.1000e-004	0.0000	5.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0120	0.0960	0.1789	2.9000e-004		4.4800e-003	4.4800e-003		4.2100e-003	4.2100e-003	0.0000	24.8615	24.8615	6.8800e-003	0.0000	25.0334
Total	**0.0120**	**0.0960**	**0.1789**	**2.9000e-004**	**4.3700e-003**	**4.4800e-003**	**8.8500e-003**	**5.1000e-004**	**4.2100e-003**	**4.7200e-003**	**0.0000**	**24.8615**	**24.8615**	**6.8800e-003**	**0.0000**	**25.0334**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.26 GH Rd North: Road removal/pipe install - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.8800e-003	0.5519	0.0865	1.7900e-003	0.0446	3.6700e-003	0.0483	0.0122	3.5100e-003	0.0157	0.0000	176.4319	176.4319	5.1100e-003	0.0280	184.8894
Vendor	4.9600e-003	0.2200	0.0514	7.5000e-004	0.0226	1.2100e-003	0.0238	6.5400e-003	1.1600e-003	7.7000e-003	0.0000	72.7272	72.7272	1.3900e-003	0.0109	76.0231
Worker	7.0700e-003	5.5400e-003	0.0638	1.8000e-004	0.0205	1.2000e-004	0.0206	5.4500e-003	1.1000e-004	5.5700e-003	0.0000	16.1107	16.1107	4.5000e-004	4.7000e-004	16.2604
Total	**0.0199**	**0.7774**	**0.2017**	**2.7200e-003**	**0.0877**	**5.0000e-003**	**0.0927**	**0.0242**	**4.7800e-003**	**0.0290**	**0.0000**	**265.2698**	**265.2698**	**6.9500e-003**	**0.0394**	**277.1728**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.9700e-003	0.0000	1.9700e-003	2.3000e-004	0.0000	2.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0120	0.0960	0.1789	2.9000e-004		4.4800e-003	4.4800e-003		4.2100e-003	4.2100e-003	0.0000	24.8614	24.8614	6.8800e-003	0.0000	25.0334
Total	**0.0120**	**0.0960**	**0.1789**	**2.9000e-004**	**1.9700e-003**	**4.4800e-003**	**6.4500e-003**	**2.3000e-004**	**4.2100e-003**	**4.4400e-003**	**0.0000**	**24.8614**	**24.8614**	**6.8800e-003**	**0.0000**	**25.0334**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.26 GH Rd North: Road removal/pipe install - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.8800e-003	0.5519	0.0865	1.7900e-003	0.0446	3.6700e-003	0.0483	0.0122	3.5100e-003	0.0157	0.0000	176.4319	176.4319	5.1100e-003	0.0280	184.8894
Vendor	4.9600e-003	0.2200	0.0514	7.5000e-004	0.0226	1.2100e-003	0.0238	6.5400e-003	1.1600e-003	7.7000e-003	0.0000	72.7272	72.7272	1.3900e-003	0.0109	76.0231
Worker	7.0700e-003	5.5400e-003	0.0638	1.8000e-004	0.0205	1.2000e-004	0.0206	5.4500e-003	1.1000e-004	5.5700e-003	0.0000	16.1107	16.1107	4.5000e-004	4.7000e-004	16.2604
Total	**0.0199**	**0.7774**	**0.2017**	**2.7200e-003**	**0.0877**	**5.0000e-003**	**0.0927**	**0.0242**	**4.7800e-003**	**0.0290**	**0.0000**	**265.2698**	**265.2698**	**6.9500e-003**	**0.0394**	**277.1728**

3.27 FBPS to Zayante: Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7000e-004	2.5100e-003	4.0900e-003	1.0000e-005		1.2000e-004	1.2000e-004		1.1000e-004	1.1000e-004	0.0000	0.5567	0.5567	1.7000e-004	0.0000	0.5611
Paving	0.0140					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0143**	**2.5100e-003**	**4.0900e-003**	**1.0000e-005**		**1.2000e-004**	**1.2000e-004**		**1.1000e-004**	**1.1000e-004**	**0.0000**	**0.5567**	**0.5567**	**1.7000e-004**	**0.0000**	**0.5611**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.27 FBPS to Zayante: Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.0000e-005	4.6800e-003	7.3000e-004	2.0000e-005	3.8000e-004	3.0000e-005	4.1000e-004	1.0000e-004	3.0000e-005	1.3000e-004	0.0000	1.4961	1.4961	4.0000e-005	2.4000e-004	1.5678
Vendor	3.0000e-005	1.4400e-003	3.4000e-004	0.0000	1.5000e-004	1.0000e-005	1.6000e-004	4.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.4757	0.4757	1.0000e-005	7.0000e-005	0.4973
Worker	5.0000e-005	4.0000e-005	4.2000e-004	0.0000	1.4000e-004	0.0000	1.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1064	0.1064	0.0000	0.0000	0.1074
Total	**1.5000e-004**	**6.1600e-003**	**1.4900e-003**	**2.0000e-005**	**6.7000e-004**	**4.0000e-005**	**7.1000e-004**	**1.8000e-004**	**4.0000e-005**	**2.2000e-004**	**0.0000**	**2.0782**	**2.0782**	**5.0000e-005**	**3.1000e-004**	**2.1724**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7000e-004	2.5100e-003	4.0900e-003	1.0000e-005		1.2000e-004	1.2000e-004		1.1000e-004	1.1000e-004	0.0000	0.5567	0.5567	1.7000e-004	0.0000	0.5611
Paving	0.0140					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0143**	**2.5100e-003**	**4.0900e-003**	**1.0000e-005**		**1.2000e-004**	**1.2000e-004**		**1.1000e-004**	**1.1000e-004**	**0.0000**	**0.5567**	**0.5567**	**1.7000e-004**	**0.0000**	**0.5611**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.27 FBPS to Zayante: Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.0000e-005	4.6800e-003	7.3000e-004	2.0000e-005	3.8000e-004	3.0000e-005	4.1000e-004	1.0000e-004	3.0000e-005	1.3000e-004	0.0000	1.4961	1.4961	4.0000e-005	2.4000e-004	1.5678
Vendor	3.0000e-005	1.4400e-003	3.4000e-004	0.0000	1.5000e-004	1.0000e-005	1.6000e-004	4.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.4757	0.4757	1.0000e-005	7.0000e-005	0.4973
Worker	5.0000e-005	4.0000e-005	4.2000e-004	0.0000	1.4000e-004	0.0000	1.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1064	0.1064	0.0000	0.0000	0.1074
Total	**1.5000e-004**	**6.1600e-003**	**1.4900e-003**	**2.0000e-005**	**6.7000e-004**	**4.0000e-005**	**7.1000e-004**	**1.8000e-004**	**4.0000e-005**	**2.2000e-004**	**0.0000**	**2.0782**	**2.0782**	**5.0000e-005**	**3.1000e-004**	**2.1724**

3.28 Zayante to Big Trees RR: Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7000e-004	2.5100e-003	4.0900e-003	1.0000e-005		1.2000e-004	1.2000e-004		1.1000e-004	1.1000e-004	0.0000	0.5567	0.5567	1.7000e-004	0.0000	0.5611
Paving	0.0140					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0143**	**2.5100e-003**	**4.0900e-003**	**1.0000e-005**		**1.2000e-004**	**1.2000e-004**		**1.1000e-004**	**1.1000e-004**	**0.0000**	**0.5567**	**0.5567**	**1.7000e-004**	**0.0000**	**0.5611**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.28 Zayante to Big Trees RR: Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-004	6.9700e-003	1.0900e-003	2.0000e-005	5.6000e-004	5.0000e-005	6.1000e-004	1.5000e-004	4.0000e-005	2.0000e-004	0.0000	2.2275	2.2275	6.0000e-005	3.5000e-004	2.3343
Vendor	5.0000e-005	2.0700e-003	4.8000e-004	1.0000e-005	2.1000e-004	1.0000e-005	2.2000e-004	6.0000e-005	1.0000e-005	7.0000e-005	0.0000	0.6850	0.6850	1.0000e-005	1.0000e-004	0.7161
Worker	5.0000e-005	4.0000e-005	4.2000e-004	0.0000	1.4000e-004	0.0000	1.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1064	0.1064	0.0000	0.0000	0.1074
Total	**2.0000e-004**	**9.0800e-003**	**1.9900e-003**	**3.0000e-005**	**9.1000e-004**	**6.0000e-005**	**9.7000e-004**	**2.5000e-004**	**5.0000e-005**	**3.1000e-004**	**0.0000**	**3.0189**	**3.0189**	**7.0000e-005**	**4.5000e-004**	**3.1577**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7000e-004	2.5100e-003	4.0900e-003	1.0000e-005		1.2000e-004	1.2000e-004		1.1000e-004	1.1000e-004	0.0000	0.5567	0.5567	1.7000e-004	0.0000	0.5611
Paving	0.0140					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0143**	**2.5100e-003**	**4.0900e-003**	**1.0000e-005**		**1.2000e-004**	**1.2000e-004**		**1.1000e-004**	**1.1000e-004**	**0.0000**	**0.5567**	**0.5567**	**1.7000e-004**	**0.0000**	**0.5611**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.28 Zayante to Big Trees RR: Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-004	6.9700e-003	1.0900e-003	2.0000e-005	5.6000e-004	5.0000e-005	6.1000e-004	1.5000e-004	4.0000e-005	2.0000e-004	0.0000	2.2275	2.2275	6.0000e-005	3.5000e-004	2.3343
Vendor	5.0000e-005	2.0700e-003	4.8000e-004	1.0000e-005	2.1000e-004	1.0000e-005	2.2000e-004	6.0000e-005	1.0000e-005	7.0000e-005	0.0000	0.6850	0.6850	1.0000e-005	1.0000e-004	0.7161
Worker	5.0000e-005	4.0000e-005	4.2000e-004	0.0000	1.4000e-004	0.0000	1.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1064	0.1064	0.0000	0.0000	0.1074
Total	**2.0000e-004**	**9.0800e-003**	**1.9900e-003**	**3.0000e-005**	**9.1000e-004**	**6.0000e-005**	**9.7000e-004**	**2.5000e-004**	**5.0000e-005**	**3.1000e-004**	**0.0000**	**3.0189**	**3.0189**	**7.0000e-005**	**4.5000e-004**	**3.1577**

3.29 GH Rd North: Pressure test - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.6000e-004	6.4500e-003	9.3000e-003	2.0000e-005		2.9000e-004	2.9000e-004		2.9000e-004	2.9000e-004	0.0000	1.4130	1.4130	6.0000e-005	0.0000	1.4146
Total	**7.6000e-004**	**6.4500e-003**	**9.3000e-003**	**2.0000e-005**		**2.9000e-004**	**2.9000e-004**		**2.9000e-004**	**2.9000e-004**	**0.0000**	**1.4130**	**1.4130**	**6.0000e-005**	**0.0000**	**1.4146**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.29 GH Rd North: Pressure test - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	5.8000e-004	1.3000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1903	0.1903	0.0000	3.0000e-005	0.1989
Worker	4.0000e-005	3.0000e-005	3.8000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0967	0.0967	0.0000	0.0000	0.0976
Total	**5.0000e-005**	**6.1000e-004**	**5.1000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.2870**	**0.2870**	**0.0000**	**3.0000e-005**	**0.2965**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.6000e-004	6.4500e-003	9.3000e-003	2.0000e-005		2.9000e-004	2.9000e-004		2.9000e-004	2.9000e-004	0.0000	1.4130	1.4130	6.0000e-005	0.0000	1.4146
Total	**7.6000e-004**	**6.4500e-003**	**9.3000e-003**	**2.0000e-005**		**2.9000e-004**	**2.9000e-004**		**2.9000e-004**	**2.9000e-004**	**0.0000**	**1.4130**	**1.4130**	**6.0000e-005**	**0.0000**	**1.4146**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.29 GH Rd North: Pressure test - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	5.8000e-004	1.3000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1903	0.1903	0.0000	3.0000e-005	0.1989
Worker	4.0000e-005	3.0000e-005	3.8000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0967	0.0967	0.0000	0.0000	0.0976
Total	**5.0000e-005**	**6.1000e-004**	**5.1000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.2870**	**0.2870**	**0.0000**	**3.0000e-005**	**0.2965**

3.30 GH Rd North: Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7400e-003	0.0251	0.0409	6.0000e-005		1.2200e-003	1.2200e-003		1.1300e-003	1.1300e-003	0.0000	5.5673	5.5673	1.7400e-003	0.0000	5.6108
Paving	0.0140					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0168**	**0.0251**	**0.0409**	**6.0000e-005**		**1.2200e-003**	**1.2200e-003**		**1.1300e-003**	**1.1300e-003**	**0.0000**	**5.5673**	**5.5673**	**1.7400e-003**	**0.0000**	**5.6108**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.30 GH Rd North: Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.7000e-004	0.0467	7.3200e-003	1.5000e-004	3.7700e-003	3.1000e-004	4.0800e-003	1.0400e-003	3.0000e-004	1.3300e-003	0.0000	14.9275	14.9275	4.3000e-004	2.3600e-003	15.6431
Vendor	3.2000e-004	0.0144	3.3600e-003	5.0000e-005	1.4800e-003	8.0000e-005	1.5600e-003	4.3000e-004	8.0000e-005	5.0000e-004	0.0000	4.7571	4.7571	9.0000e-005	7.2000e-004	4.9727
Worker	4.7000e-004	3.7000e-004	4.2100e-003	1.0000e-005	1.3500e-003	1.0000e-005	1.3600e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.0637	1.0637	3.0000e-005	3.0000e-005	1.0736
Total	**1.4600e-003**	**0.0615**	**0.0149**	**2.1000e-004**	**6.6000e-003**	**4.0000e-004**	**7.0000e-003**	**1.8300e-003**	**3.9000e-004**	**2.2000e-003**	**0.0000**	**20.7484**	**20.7484**	**5.5000e-004**	**3.1100e-003**	**21.6894**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7400e-003	0.0251	0.0409	6.0000e-005		1.2200e-003	1.2200e-003		1.1300e-003	1.1300e-003	0.0000	5.5673	5.5673	1.7400e-003	0.0000	5.6108
Paving	0.0140					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0168**	**0.0251**	**0.0409**	**6.0000e-005**		**1.2200e-003**	**1.2200e-003**		**1.1300e-003**	**1.1300e-003**	**0.0000**	**5.5673**	**5.5673**	**1.7400e-003**	**0.0000**	**5.6108**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.30 GH Rd North: Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.7000e-004	0.0467	7.3200e-003	1.5000e-004	3.7700e-003	3.1000e-004	4.0800e-003	1.0400e-003	3.0000e-004	1.3300e-003	0.0000	14.9275	14.9275	4.3000e-004	2.3600e-003	15.6431
Vendor	3.2000e-004	0.0144	3.3600e-003	5.0000e-005	1.4800e-003	8.0000e-005	1.5600e-003	4.3000e-004	8.0000e-005	5.0000e-004	0.0000	4.7571	4.7571	9.0000e-005	7.2000e-004	4.9727
Worker	4.7000e-004	3.7000e-004	4.2100e-003	1.0000e-005	1.3500e-003	1.0000e-005	1.3600e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.0637	1.0637	3.0000e-005	3.0000e-005	1.0736
Total	**1.4600e-003**	**0.0615**	**0.0149**	**2.1000e-004**	**6.6000e-003**	**4.0000e-004**	**7.0000e-003**	**1.8300e-003**	**3.9000e-004**	**2.2000e-003**	**0.0000**	**20.7484**	**20.7484**	**5.5000e-004**	**3.1100e-003**	**21.6894**

3.31 GH Rd South: Road removal/pipe install - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.8100e-003	0.0000	1.8100e-003	2.4000e-004	0.0000	2.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.4400e-003	0.0598	0.1114	1.8000e-004		2.7900e-003	2.7900e-003		2.6200e-003	2.6200e-003	0.0000	15.4750	15.4750	4.2800e-003	0.0000	15.5820
Total	**7.4400e-003**	**0.0598**	**0.1114**	**1.8000e-004**	**1.8100e-003**	**2.7900e-003**	**4.6000e-003**	**2.4000e-004**	**2.6200e-003**	**2.8600e-003**	**0.0000**	**15.4750**	**15.4750**	**4.2800e-003**	**0.0000**	**15.5820**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.31 GH Rd South: Road removal/pipe install - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.8100e-003	0.6871	0.1076	2.2200e-003	0.0555	4.5600e-003	0.0601	0.0152	4.3700e-003	0.0196	0.0000	219.6336	219.6336	6.3600e-003	0.0348	230.1619
Vendor	4.4400e-003	0.1966	0.0460	6.7000e-004	0.0202	1.0800e-003	0.0213	5.8400e-003	1.0300e-003	6.8800e-003	0.0000	65.0016	65.0016	1.2400e-003	9.7800e-003	67.9474
Worker	4.4000e-003	3.4500e-003	0.0397	1.1000e-004	0.0128	8.0000e-005	0.0128	3.3900e-003	7.0000e-005	3.4700e-003	0.0000	10.0281	10.0281	2.8000e-004	2.9000e-004	10.1213
Total	**0.0187**	**0.8871**	**0.1933**	**3.0000e-003**	**0.0885**	**5.7200e-003**	**0.0942**	**0.0245**	**5.4700e-003**	**0.0299**	**0.0000**	**294.6633**	**294.6633**	**7.8800e-003**	**0.0449**	**308.2306**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.2000e-004	0.0000	8.2000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.4400e-003	0.0598	0.1114	1.8000e-004		2.7900e-003	2.7900e-003		2.6200e-003	2.6200e-003	0.0000	15.4750	15.4750	4.2800e-003	0.0000	15.5820
Total	**7.4400e-003**	**0.0598**	**0.1114**	**1.8000e-004**	**8.2000e-004**	**2.7900e-003**	**3.6100e-003**	**1.1000e-004**	**2.6200e-003**	**2.7300e-003**	**0.0000**	**15.4750**	**15.4750**	**4.2800e-003**	**0.0000**	**15.5820**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.31 GH Rd South: Road removal/pipe install - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.8100e-003	0.6871	0.1076	2.2200e-003	0.0555	4.5600e-003	0.0601	0.0152	4.3700e-003	0.0196	0.0000	219.6336	219.6336	6.3600e-003	0.0348	230.1619
Vendor	4.4400e-003	0.1966	0.0460	6.7000e-004	0.0202	1.0800e-003	0.0213	5.8400e-003	1.0300e-003	6.8800e-003	0.0000	65.0016	65.0016	1.2400e-003	9.7800e-003	67.9474
Worker	4.4000e-003	3.4500e-003	0.0397	1.1000e-004	0.0128	8.0000e-005	0.0128	3.3900e-003	7.0000e-005	3.4700e-003	0.0000	10.0281	10.0281	2.8000e-004	2.9000e-004	10.1213
Total	**0.0187**	**0.8871**	**0.1933**	**3.0000e-003**	**0.0885**	**5.7200e-003**	**0.0942**	**0.0245**	**5.4700e-003**	**0.0299**	**0.0000**	**294.6633**	**294.6633**	**7.8800e-003**	**0.0449**	**308.2306**

3.32 GH Rd North: Tie in to FBPS - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.32 GH Rd North: Tie in to FBPS - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	2.9000e-004	7.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0951	0.0951	0.0000	1.0000e-005	0.0995
Worker	2.0000e-005	2.0000e-005	1.9000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0484	0.0484	0.0000	0.0000	0.0488
Total	**3.0000e-005**	**3.1000e-004**	**2.6000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1435**	**0.1435**	**0.0000**	**1.0000e-005**	**0.1483**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.32 GH Rd North: Tie in to FBPS - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	2.9000e-004	7.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0951	0.0951	0.0000	1.0000e-005	0.0995
Worker	2.0000e-005	2.0000e-005	1.9000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0484	0.0484	0.0000	0.0000	0.0488
Total	**3.0000e-005**	**3.1000e-004**	**2.6000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1435**	**0.1435**	**0.0000**	**1.0000e-005**	**0.1483**

3.33 GH Rd South: Test pipeline - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.2000e-004	7.7400e-003	0.0112	2.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	1.6956	1.6956	7.0000e-005	0.0000	1.6975
Total	**9.2000e-004**	**7.7400e-003**	**0.0112**	**2.0000e-005**		**3.5000e-004**	**3.5000e-004**		**3.5000e-004**	**3.5000e-004**	**0.0000**	**1.6956**	**1.6956**	**7.0000e-005**	**0.0000**	**1.6975**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.33 GH Rd South: Test pipeline - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	6.9000e-004	1.6000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2283	0.2283	0.0000	3.0000e-005	0.2387
Worker	5.0000e-005	4.0000e-005	4.6000e-004	0.0000	1.5000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1160	0.1160	0.0000	0.0000	0.1171
Total	**7.0000e-005**	**7.3000e-004**	**6.2000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.3444**	**0.3444**	**0.0000**	**3.0000e-005**	**0.3558**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.2000e-004	7.7400e-003	0.0112	2.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	1.6956	1.6956	7.0000e-005	0.0000	1.6975
Total	**9.2000e-004**	**7.7400e-003**	**0.0112**	**2.0000e-005**		**3.5000e-004**	**3.5000e-004**		**3.5000e-004**	**3.5000e-004**	**0.0000**	**1.6956**	**1.6956**	**7.0000e-005**	**0.0000**	**1.6975**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.33 GH Rd South: Test pipeline - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	6.9000e-004	1.6000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2283	0.2283	0.0000	3.0000e-005	0.2387
Worker	5.0000e-005	4.0000e-005	4.6000e-004	0.0000	1.5000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1160	0.1160	0.0000	0.0000	0.1171
Total	**7.0000e-005**	**7.3000e-004**	**6.2000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.3444**	**0.3444**	**0.0000**	**3.0000e-005**	**0.3558**

3.34 GH Rd South: Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3700e-003	0.0126	0.0205	3.0000e-005		6.1000e-004	6.1000e-004		5.6000e-004	5.6000e-004	0.0000	2.7837	2.7837	8.7000e-004	0.0000	2.8054
Paving	0.0140					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0154**	**0.0126**	**0.0205**	**3.0000e-005**		**6.1000e-004**	**6.1000e-004**		**5.6000e-004**	**5.6000e-004**	**0.0000**	**2.7837**	**2.7837**	**8.7000e-004**	**0.0000**	**2.8054**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.34 GH Rd South: Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.7000e-004	0.0467	7.3200e-003	1.5000e-004	3.7700e-003	3.1000e-004	4.0800e-003	1.0400e-003	3.0000e-004	1.3300e-003	0.0000	14.9275	14.9275	4.3000e-004	2.3600e-003	15.6431
Vendor	3.0000e-004	0.0134	3.1300e-003	5.0000e-005	1.3800e-003	7.0000e-005	1.4500e-003	4.0000e-004	7.0000e-005	4.7000e-004	0.0000	4.4241	4.4241	8.0000e-005	6.7000e-004	4.6246
Worker	2.3000e-004	1.8000e-004	2.1100e-003	1.0000e-005	6.8000e-004	0.0000	6.8000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5319	0.5319	1.0000e-005	2.0000e-005	0.5368
Total	**1.2000e-003**	**0.0603**	**0.0126**	**2.1000e-004**	**5.8300e-003**	**3.8000e-004**	**6.2100e-003**	**1.6200e-003**	**3.7000e-004**	**1.9800e-003**	**0.0000**	**19.8835**	**19.8835**	**5.2000e-004**	**3.0500e-003**	**20.8045**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3700e-003	0.0126	0.0205	3.0000e-005		6.1000e-004	6.1000e-004		5.6000e-004	5.6000e-004	0.0000	2.7836	2.7836	8.7000e-004	0.0000	2.8054
Paving	0.0140					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0154**	**0.0126**	**0.0205**	**3.0000e-005**		**6.1000e-004**	**6.1000e-004**		**5.6000e-004**	**5.6000e-004**	**0.0000**	**2.7836**	**2.7836**	**8.7000e-004**	**0.0000**	**2.8054**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.34 GH Rd South: Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.7000e-004	0.0467	7.3200e-003	1.5000e-004	3.7700e-003	3.1000e-004	4.0800e-003	1.0400e-003	3.0000e-004	1.3300e-003	0.0000	14.9275	14.9275	4.3000e-004	2.3600e-003	15.6431
Vendor	3.0000e-004	0.0134	3.1300e-003	5.0000e-005	1.3800e-003	7.0000e-005	1.4500e-003	4.0000e-004	7.0000e-005	4.7000e-004	0.0000	4.4241	4.4241	8.0000e-005	6.7000e-004	4.6246
Worker	2.3000e-004	1.8000e-004	2.1100e-003	1.0000e-005	6.8000e-004	0.0000	6.8000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5319	0.5319	1.0000e-005	2.0000e-005	0.5368
Total	**1.2000e-003**	**0.0603**	**0.0126**	**2.1000e-004**	**5.8300e-003**	**3.8000e-004**	**6.2100e-003**	**1.6200e-003**	**3.7000e-004**	**1.9800e-003**	**0.0000**	**19.8835**	**19.8835**	**5.2000e-004**	**3.0500e-003**	**20.8045**

3.35 GH Rd South: GHWTP tie in - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.4000e-004	1.4500e-003	2.2400e-003	0.0000		7.0000e-005	7.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.2738	0.2738	9.0000e-005	0.0000	0.2760
Total	**1.4000e-004**	**1.4500e-003**	**2.2400e-003**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.2738**	**0.2738**	**9.0000e-005**	**0.0000**	**0.2760**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.35 GH Rd South: GHWTP tie in - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	1.2000e-004	3.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0381	0.0381	0.0000	1.0000e-005	0.0398
Worker	1.0000e-005	1.0000e-005	8.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0193	0.0193	0.0000	0.0000	0.0195
Total	**1.0000e-005**	**1.3000e-004**	**1.1000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0574**	**0.0574**	**0.0000**	**1.0000e-005**	**0.0593**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.4000e-004	1.4500e-003	2.2400e-003	0.0000		7.0000e-005	7.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.2738	0.2738	9.0000e-005	0.0000	0.2760
Total	**1.4000e-004**	**1.4500e-003**	**2.2400e-003**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.2738**	**0.2738**	**9.0000e-005**	**0.0000**	**0.2760**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.35 GH Rd South: GHWTP tie in - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	1.2000e-004	3.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0381	0.0381	0.0000	1.0000e-005	0.0398
Worker	1.0000e-005	1.0000e-005	8.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0193	0.0193	0.0000	0.0000	0.0195
Total	**1.0000e-005**	**1.3000e-004**	**1.1000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0574**	**0.0574**	**0.0000**	**1.0000e-005**	**0.0593**

3.36 GH Rd South: Pavement striping - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0972					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.7000e-004	5.1400e-003	4.0600e-003	2.0000e-005		1.9000e-004	1.9000e-004		1.8000e-004	1.8000e-004	0.0000	1.4841	1.4841	4.8000e-004	0.0000	1.4961
Total	**0.0977**	**5.1400e-003**	**4.0600e-003**	**2.0000e-005**		**1.9000e-004**	**1.9000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**1.4841**	**1.4841**	**4.8000e-004**	**0.0000**	**1.4961**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.36 GH Rd South: Pavement striping - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	2.9000e-004	7.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0951	0.0951	0.0000	1.0000e-005	0.0995
Worker	2.0000e-005	2.0000e-005	1.9000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0484	0.0484	0.0000	0.0000	0.0488
Total	**3.0000e-005**	**3.1000e-004**	**2.6000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1435**	**0.1435**	**0.0000**	**1.0000e-005**	**0.1483**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0972					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.7000e-004	5.1400e-003	4.0600e-003	2.0000e-005		1.9000e-004	1.9000e-004		1.8000e-004	1.8000e-004	0.0000	1.4841	1.4841	4.8000e-004	0.0000	1.4961
Total	**0.0977**	**5.1400e-003**	**4.0600e-003**	**2.0000e-005**		**1.9000e-004**	**1.9000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**1.4841**	**1.4841**	**4.8000e-004**	**0.0000**	**1.4961**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.36 GH Rd South: Pavement striping - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	2.9000e-004	7.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0951	0.0951	0.0000	1.0000e-005	0.0995
Worker	2.0000e-005	2.0000e-005	1.9000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0484	0.0484	0.0000	0.0000	0.0488
Total	**3.0000e-005**	**3.1000e-004**	**2.6000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1435**	**0.1435**	**0.0000**	**1.0000e-005**	**0.1483**

3.37 GH Rd South: Cathodic protection - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.3000e-004	0.0103	8.1200e-003	3.0000e-005		3.9000e-004	3.9000e-004		3.6000e-004	3.6000e-004	0.0000	2.9682	2.9682	9.6000e-004	0.0000	2.9922
Total	**9.3000e-004**	**0.0103**	**8.1200e-003**	**3.0000e-005**		**3.9000e-004**	**3.9000e-004**		**3.6000e-004**	**3.6000e-004**	**0.0000**	**2.9682**	**2.9682**	**9.6000e-004**	**0.0000**	**2.9922**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.37 GH Rd South: Cathodic protection - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	5.8000e-004	1.3000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1903	0.1903	0.0000	3.0000e-005	0.1989
Worker	4.0000e-005	3.0000e-005	3.8000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0967	0.0967	0.0000	0.0000	0.0976
Total	**5.0000e-005**	**6.1000e-004**	**5.1000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.2870**	**0.2870**	**0.0000**	**3.0000e-005**	**0.2965**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.3000e-004	0.0103	8.1200e-003	3.0000e-005		3.9000e-004	3.9000e-004		3.6000e-004	3.6000e-004	0.0000	2.9682	2.9682	9.6000e-004	0.0000	2.9922
Total	**9.3000e-004**	**0.0103**	**8.1200e-003**	**3.0000e-005**		**3.9000e-004**	**3.9000e-004**		**3.6000e-004**	**3.6000e-004**	**0.0000**	**2.9682**	**2.9682**	**9.6000e-004**	**0.0000**	**2.9922**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.37 GH Rd South: Cathodic protection - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-005	5.8000e-004	1.3000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1903	0.1903	0.0000	3.0000e-005	0.1989
Worker	4.0000e-005	3.0000e-005	3.8000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0967	0.0967	0.0000	0.0000	0.0976
Total	**5.0000e-005**	**6.1000e-004**	**5.1000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.2870**	**0.2870**	**0.0000**	**3.0000e-005**	**0.2965**

3.38 Abandon Existing NCP: Outside Henry Cowell - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.6000e-004	6.5700e-003	5.4200e-003	1.0000e-005		2.6000e-004	2.6000e-004		2.5000e-004	2.5000e-004	0.0000	0.8861	0.8861	1.5000e-004	0.0000	0.8898
Total	**9.6000e-004**	**6.5700e-003**	**5.4200e-003**	**1.0000e-005**		**2.6000e-004**	**2.6000e-004**		**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.8861**	**0.8861**	**1.5000e-004**	**0.0000**	**0.8898**

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3.38 Abandon Existing NCP: Outside Henry Cowell - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.6000e-004	0.0180	2.8200e-003	6.0000e-005	1.4500e-003	1.2000e-004	1.5700e-003	4.0000e-004	1.1000e-004	5.1000e-004	0.0000	5.7516	5.7516	1.7000e-004	9.1000e-004	6.0273
Vendor	1.4000e-004	6.0400e-003	1.4100e-003	2.0000e-005	6.2000e-004	3.0000e-005	6.5000e-004	1.8000e-004	3.0000e-005	2.1000e-004	0.0000	1.9980	1.9980	4.0000e-005	3.0000e-004	2.0886
Worker	1.9000e-004	1.5000e-004	1.7200e-003	0.0000	5.5000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4352	0.4352	1.0000e-005	1.0000e-005	0.4392
Total	**5.9000e-004**	**0.0242**	**5.9500e-003**	**8.0000e-005**	**2.6200e-003**	**1.5000e-004**	**2.7800e-003**	**7.3000e-004**	**1.4000e-004**	**8.7000e-004**	**0.0000**	**8.1847**	**8.1847**	**2.2000e-004**	**1.2200e-003**	**8.5550**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.6000e-004	6.5700e-003	5.4200e-003	1.0000e-005		2.6000e-004	2.6000e-004		2.5000e-004	2.5000e-004	0.0000	0.8861	0.8861	1.5000e-004	0.0000	0.8898
Total	**9.6000e-004**	**6.5700e-003**	**5.4200e-003**	**1.0000e-005**		**2.6000e-004**	**2.6000e-004**		**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.8861**	**0.8861**	**1.5000e-004**	**0.0000**	**0.8898**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.38 Abandon Existing NCP: Outside Henry Cowell - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.6000e-004	0.0180	2.8200e-003	6.0000e-005	1.4500e-003	1.2000e-004	1.5700e-003	4.0000e-004	1.1000e-004	5.1000e-004	0.0000	5.7516	5.7516	1.7000e-004	9.1000e-004	6.0273
Vendor	1.4000e-004	6.0400e-003	1.4100e-003	2.0000e-005	6.2000e-004	3.0000e-005	6.5000e-004	1.8000e-004	3.0000e-005	2.1000e-004	0.0000	1.9980	1.9980	4.0000e-005	3.0000e-004	2.0886
Worker	1.9000e-004	1.5000e-004	1.7200e-003	0.0000	5.5000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4352	0.4352	1.0000e-005	1.0000e-005	0.4392
Total	**5.9000e-004**	**0.0242**	**5.9500e-003**	**8.0000e-005**	**2.6200e-003**	**1.5000e-004**	**2.7800e-003**	**7.3000e-004**	**1.4000e-004**	**8.7000e-004**	**0.0000**	**8.1847**	**8.1847**	**2.2000e-004**	**1.2200e-003**	**8.5550**

3.38 Abandon Existing NCP: Outside Henry Cowell - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3000e-004	8.6000e-004	7.2000e-004	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.1182	0.1182	2.0000e-005	0.0000	0.1187
Total	**1.3000e-004**	**8.6000e-004**	**7.2000e-004**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.1182**	**0.1182**	**2.0000e-005**	**0.0000**	**0.1187**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.38 Abandon Existing NCP: Outside Henry Cowell - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.0000e-005	2.2800e-003	3.8000e-004	1.0000e-005	1.9000e-004	2.0000e-005	2.1000e-004	5.0000e-005	1.0000e-005	7.0000e-005	0.0000	0.7498	0.7498	2.0000e-005	1.2000e-004	0.7857
Vendor	2.0000e-005	7.8000e-004	1.8000e-004	0.0000	8.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	3.0000e-005	0.0000	0.2615	0.2615	1.0000e-005	4.0000e-005	0.2733
Worker	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0562	0.0562	0.0000	0.0000	0.0567
Total	**7.0000e-005**	**3.0800e-003**	**7.7000e-004**	**1.0000e-005**	**3.4000e-004**	**2.0000e-005**	**3.7000e-004**	**9.0000e-005**	**1.0000e-005**	**1.2000e-004**	**0.0000**	**1.0674**	**1.0674**	**3.0000e-005**	**1.6000e-004**	**1.1157**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3000e-004	8.6000e-004	7.2000e-004	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.1182	0.1182	2.0000e-005	0.0000	0.1187
Total	**1.3000e-004**	**8.6000e-004**	**7.2000e-004**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.1182**	**0.1182**	**2.0000e-005**	**0.0000**	**0.1187**

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3.38 Abandon Existing NCP: Outside Henry Cowell - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.0000e-005	2.2800e-003	3.8000e-004	1.0000e-005	1.9000e-004	2.0000e-005	2.1000e-004	5.0000e-005	1.0000e-005	7.0000e-005	0.0000	0.7498	0.7498	2.0000e-005	1.2000e-004	0.7857
Vendor	2.0000e-005	7.8000e-004	1.8000e-004	0.0000	8.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	3.0000e-005	0.0000	0.2615	0.2615	1.0000e-005	4.0000e-005	0.2733
Worker	2.0000e-005	2.0000e-005	2.1000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0562	0.0562	0.0000	0.0000	0.0567
Total	**7.0000e-005**	**3.0800e-003**	**7.7000e-004**	**1.0000e-005**	**3.4000e-004**	**2.0000e-005**	**3.7000e-004**	**9.0000e-005**	**1.0000e-005**	**1.2000e-004**	**0.0000**	**1.0674**	**1.0674**	**3.0000e-005**	**1.6000e-004**	**1.1157**

3.39 Abandon Existing NCP: Inside Henry Cowell - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2800e-003	0.0155	0.0130	3.0000e-005		5.9000e-004	5.9000e-004		5.8000e-004	5.8000e-004	0.0000	2.1272	2.1272	3.6000e-004	0.0000	2.1362
Total	**2.2800e-003**	**0.0155**	**0.0130**	**3.0000e-005**		**5.9000e-004**	**5.9000e-004**		**5.8000e-004**	**5.8000e-004**	**0.0000**	**2.1272**	**2.1272**	**3.6000e-004**	**0.0000**	**2.1362**

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3.39 Abandon Existing NCP: Inside Henry Cowell - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.9000e-004	0.0411	6.7900e-003	1.4000e-004	3.4900e-003	2.8000e-004	3.7700e-003	9.6000e-004	2.6000e-004	1.2200e-003	0.0000	13.5072	13.5072	4.0000e-004	2.1400e-003	14.1550
Vendor	3.1000e-004	0.0140	3.3100e-003	5.0000e-005	1.4900e-003	8.0000e-005	1.5700e-003	4.3000e-004	7.0000e-005	5.0000e-004	0.0000	4.7062	4.7062	9.0000e-005	7.1000e-004	4.9194
Worker	4.3000e-004	3.2000e-004	3.8300e-003	1.0000e-005	1.3300e-003	1.0000e-005	1.3400e-003	3.5000e-004	1.0000e-005	3.6000e-004	0.0000	1.0110	1.0110	3.0000e-005	3.0000e-005	1.0200
Total	**1.3300e-003**	**0.0555**	**0.0139**	**2.0000e-004**	**6.3100e-003**	**3.7000e-004**	**6.6800e-003**	**1.7400e-003**	**3.4000e-004**	**2.0800e-003**	**0.0000**	**19.2244**	**19.2244**	**5.2000e-004**	**2.8800e-003**	**20.0943**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2800e-003	0.0155	0.0130	3.0000e-005		5.9000e-004	5.9000e-004		5.8000e-004	5.8000e-004	0.0000	2.1272	2.1272	3.6000e-004	0.0000	2.1362
Total	**2.2800e-003**	**0.0155**	**0.0130**	**3.0000e-005**		**5.9000e-004**	**5.9000e-004**		**5.8000e-004**	**5.8000e-004**	**0.0000**	**2.1272**	**2.1272**	**3.6000e-004**	**0.0000**	**2.1362**

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3.39 Abandon Existing NCP: Inside Henry Cowell - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.9000e-004	0.0411	6.7900e-003	1.4000e-004	3.4900e-003	2.8000e-004	3.7700e-003	9.6000e-004	2.6000e-004	1.2200e-003	0.0000	13.5072	13.5072	4.0000e-004	2.1400e-003	14.1550
Vendor	3.1000e-004	0.0140	3.3100e-003	5.0000e-005	1.4900e-003	8.0000e-005	1.5700e-003	4.3000e-004	7.0000e-005	5.0000e-004	0.0000	4.7062	4.7062	9.0000e-005	7.1000e-004	4.9194
Worker	4.3000e-004	3.2000e-004	3.8300e-003	1.0000e-005	1.3300e-003	1.0000e-005	1.3400e-003	3.5000e-004	1.0000e-005	3.6000e-004	0.0000	1.0110	1.0110	3.0000e-005	3.0000e-005	1.0200
Total	**1.3300e-003**	**0.0555**	**0.0139**	**2.0000e-004**	**6.3100e-003**	**3.7000e-004**	**6.6800e-003**	**1.7400e-003**	**3.4000e-004**	**2.0800e-003**	**0.0000**	**19.2244**	**19.2244**	**5.2000e-004**	**2.8800e-003**	**20.0943**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.552058	0.056962	0.193821	0.123008	0.021404	0.005318	0.010231	0.003525	0.000574	0.000778	0.028458	0.000952	0.002912

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0301	0.0000	1.4000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.7000e-004	2.7000e-004	0.0000	0.0000	2.8000e-004
Unmitigated	0.0301	0.0000	1.4000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.7000e-004	2.7000e-004	0.0000	0.0000	2.8000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0301					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.4000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.7000e-004	2.7000e-004	0.0000	0.0000	2.8000e-004
Total	**0.0301**	**0.0000**	**1.4000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.7000e-004**	**2.7000e-004**	**0.0000**	**0.0000**	**2.8000e-004**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0301					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.4000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.7000e-004	2.7000e-004	0.0000	0.0000	2.8000e-004
Total	**0.0301**	**0.0000**	**1.4000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.7000e-004**	**2.7000e-004**	**0.0000**	**0.0000**	**2.8000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Santa Cruz County, Mitigation Report

Construction Mitigation Summary

Phase	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Abandon Existing NCP: Inside Henry Cowell	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Abandon Existing NCP: Outside Henry Cowell	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Big Trees RR Crossing: Backfill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Big Trees RR Crossing: Boring and casing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Big Trees RR Crossing: Grout	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Big Trees RR Crossing: Pipe install	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Big Trees RR Crossing: Shaft excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Abandon existing pipeline	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Carrier pipeline staging area prep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Demobilization	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: HDD (North entry)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: HDD (pullback)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: HDD (South entry)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Mobilization (North HDD pit)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Mobilization (South HDD pit)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Restoration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Newell Creek Pipeline Construction - Near Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Brackney North: Tie-in pipeline construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FBPS to Zayante: Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FBPS to Zayante: Road removal/pipe install	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd North: Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd North: Pressure test	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd North: Road removal/pipe install	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd North: Tie in to FBPS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd South: Cathodic protection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd South: GHWTP tie in	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd South: Pavement striping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd South: Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd South: Road removal/pipe install	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd South: Test pipeline	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NCP FBPS to Graham Hill WTP: Staging area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: CIDH Piles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: Grade for drainage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: Install flex connect	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: Install pipe span	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: Pier scour protect	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: Pipe support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zayante to Big Trees RR: Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zayante to Big Trees RR: Road removal/pipe install	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Newell Creek Pipeline Construction - Near Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

OFFROAD Equipment Mitigation

Equipment Type	Fuel Type	Tier	Number Mitigated	Total Number of Equipment	DPF	Oxidation Catalyst
Aerial Lifts	Diesel	No Change	0	0	No Change	0.00
Air Compressors	Diesel	No Change	0	1	No Change	0.00
Bore/Drill Rigs	Diesel	No Change	0	5	No Change	0.00
Cement and Mortar Mixers	Diesel	No Change	0	11	No Change	0.00
Concrete/Industrial Saws	Diesel	No Change	0	5	No Change	0.00
Cranes	Diesel	No Change	0	1	No Change	0.00
Plate Compactors	Diesel	No Change	0	8	No Change	0.00
Dumpers/Tenders	Diesel	No Change	0	19	No Change	0.00
Excavators	Diesel	No Change	0	26	No Change	0.00
Forklifts	Diesel	No Change	0	2	No Change	0.00
Generator Sets	Diesel	No Change	0	13	No Change	0.00
Graders	Diesel	No Change	0	0	No Change	0.00
Surfacing Equipment	Diesel	No Change	0	2	No Change	0.00
Other General Industrial Equipment	Diesel	No Change	0	4	No Change	0.00
Other Material Handling Equipment	Diesel	No Change	0	3	No Change	0.00
Pavers	Diesel	No Change	0	5	No Change	0.00
Paving Equipment	Diesel	No Change	0	1	No Change	0.00
Pumps	Diesel	No Change	0	13	No Change	0.00
Rollers	Diesel	No Change	0	11	No Change	0.00

Newell Creek Pipeline Construction - Near Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Rubber Tired Dozers	Diesel	No Change	0	0	No Change	0.00
Scrapers	Diesel	No Change	0	0	No Change	0.00
Skid Steer Loaders	Diesel	No Change	0	8	No Change	0.00
Tractors/Loaders/Backhoes	Diesel	No Change	0	33	No Change	0.00
Welders	Diesel	No Change	0	2	No Change	0.00

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Unmitigated tons/yr						Unmitigated mt/yr					
Aerial Lifts	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Air Compressors	2.56000E-003	1.73700E-002	2.41500E-002	4.00000E-005	9.40000E-004	9.40000E-004	0.00000E+000	3.40434E+000	3.40434E+000	2.00000E-004	0.00000E+000	3.40943E+000
Bore/Drill Rigs	1.93500E-002	1.94340E-001	1.76990E-001	8.20000E-004	6.24000E-003	5.74000E-003	0.00000E+000	7.19124E+001	7.19124E+001	2.32600E-002	0.00000E+000	7.24938E+001
Cement and Mortar Mixers	3.75000E-003	2.34900E-002	1.96800E-002	5.00000E-005	9.10000E-004	9.10000E-004	0.00000E+000	2.92438E+000	2.92438E+000	3.00000E-004	0.00000E+000	2.93197E+000
Concrete/Industrial Saws	4.42000E-003	3.41700E-002	5.06700E-002	9.00000E-005	1.60000E-003	1.60000E-003	0.00000E+000	7.45999E+000	7.45999E+000	3.60000E-004	0.00000E+000	7.46894E+000
Cranes	2.64000E-003	2.86200E-002	1.37600E-002	4.00000E-005	1.20000E-003	1.10000E-003	0.00000E+000	3.80214E+000	3.80214E+000	1.23000E-003	0.00000E+000	3.83288E+000
Dumpers/Tenders	6.99000E-003	4.42200E-002	2.38800E-002	7.00000E-005	1.65000E-003	1.65000E-003	0.00000E+000	5.26236E+000	5.26236E+000	5.60000E-004	0.00000E+000	5.27648E+000
Excavators	4.84900E-002	4.12420E-001	8.07000E-001	1.28000E-003	2.00400E-002	1.84400E-002	0.00000E+000	1.12395E+002	1.12395E+002	3.63500E-002	0.00000E+000	1.13303E+002
Forklifts	8.38000E-003	7.78000E-002	8.50900E-002	1.10000E-004	5.15000E-003	4.74000E-003	0.00000E+000	9.90398E+000	9.90398E+000	3.20000E-003	0.00000E+000	9.98406E+000
Generator Sets	7.64000E-002	6.77990E-001	8.51880E-001	1.52000E-003	3.39900E-002	3.39900E-002	0.00000E+000	1.30987E+002	1.30987E+002	6.22000E-003	0.00000E+000	1.31142E+002
Graders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Other General Industrial Equipment	1.36300E-002	1.28750E-001	1.47600E-001	2.00000E-004	8.01000E-003	7.37000E-003	0.00000E+000	1.71561E+001	1.71561E+001	5.55000E-003	0.00000E+000	1.72948E+001

Newell Creek Pipeline Construction - Near Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Other Material Handling Equipment	2.05200E-002	1.72270E-001	2.88910E-001	4.40000E-004	9.35000E-003	8.60000E-003	0.00000E+000	3.89683E+001	3.89683E+001	1.26000E-002	0.00000E+000	3.92834E+001
Pavers	3.54000E-003	3.49000E-002	4.78400E-002	8.00000E-005	1.82000E-003	1.67000E-003	0.00000E+000	6.62772E+000	6.62772E+000	2.14000E-003	0.00000E+000	6.68131E+000
Paving Equipment	2.25000E-003	2.13100E-002	3.32000E-002	5.00000E-005	1.04000E-003	9.50000E-004	0.00000E+000	4.65211E+000	4.65211E+000	1.50000E-003	0.00000E+000	4.68973E+000
Plate Compactors	4.70000E-004	2.95000E-003	2.47000E-003	1.00000E-005	1.10000E-004	1.10000E-004	0.00000E+000	3.67530E-001	3.67530E-001	4.00000E-005	0.00000E+000	3.68480E-001
Pumps	8.46800E-002	7.14270E-001	9.02070E-001	1.59000E-003	3.73000E-002	3.73000E-002	0.00000E+000	1.36639E+002	1.36639E+002	6.93000E-003	0.00000E+000	1.36812E+002
Rollers	6.92000E-003	7.14900E-002	9.07000E-002	1.30000E-004	3.86000E-003	3.55000E-003	0.00000E+000	1.16832E+001	1.16832E+001	3.78000E-003	0.00000E+000	1.17777E+001
Rubber Tired Dozers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Scrapers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Skid Steer Loaders	1.22000E-003	1.61600E-002	2.68800E-002	4.00000E-005	5.20000E-004	4.80000E-004	0.00000E+000	3.53209E+000	3.53209E+000	1.14000E-003	0.00000E+000	3.56065E+000
Surfacing Equipment	1.40000E-003	1.54200E-002	1.21900E-002	5.00000E-005	5.80000E-004	5.40000E-004	0.00000E+000	4.45235E+000	4.45235E+000	1.44000E-003	0.00000E+000	4.48835E+000
Tractors/Loaders/ Backhoes	3.68900E-002	3.60820E-001	5.43880E-001	7.80000E-004	1.84500E-002	1.69800E-002	0.00000E+000	6.81989E+001	6.81989E+001	2.20600E-002	0.00000E+000	6.87503E+001
Welders	8.09000E-003	4.34800E-002	5.07000E-002	8.00000E-005	1.83000E-003	1.83000E-003	0.00000E+000	5.64662E+000	5.64662E+000	6.60000E-004	0.00000E+000	5.66304E+000

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Mitigated tons/yr						Mitigated mt/yr					
Aerial Lifts	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Air Compressors	2.56000E-003	1.73700E-002	2.41500E-002	4.00000E-005	9.40000E-004	9.40000E-004	0.00000E+000	3.40433E+000	3.40433E+000	2.00000E-004	0.00000E+000	3.40943E+000
Bore/Drill Rigs	1.93500E-002	1.94340E-001	1.76990E-001	8.20000E-004	6.24000E-003	5.74000E-003	0.00000E+000	7.19123E+001	7.19123E+001	2.32600E-002	0.00000E+000	7.24937E+001
Cement and Mortar Mixers	3.75000E-003	2.34900E-002	1.96800E-002	5.00000E-005	9.10000E-004	9.10000E-004	0.00000E+000	2.92437E+000	2.92437E+000	3.00000E-004	0.00000E+000	2.93196E+000
Concrete/Industrial Saws	4.42000E-003	3.41700E-002	5.06700E-002	9.00000E-005	1.60000E-003	1.60000E-003	0.00000E+000	7.45998E+000	7.45998E+000	3.60000E-004	0.00000E+000	7.46893E+000
Cranes	2.64000E-003	2.86200E-002	1.37600E-002	4.00000E-005	1.20000E-003	1.10000E-003	0.00000E+000	3.80214E+000	3.80214E+000	1.23000E-003	0.00000E+000	3.83288E+000

Newell Creek Pipeline Construction - Near Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Dumpers/Tenders	6.99000E-003	4.42200E-002	2.38800E-002	7.00000E-005	1.65000E-003	1.65000E-003	0.00000E+000	5.26235E+000	5.26235E+000	5.60000E-004	0.00000E+000	5.27647E+000
Excavators	4.84900E-002	4.12410E-001	8.07000E-001	1.28000E-003	2.00400E-002	1.84400E-002	0.00000E+000	1.12394E+002	1.12394E+002	3.63500E-002	0.00000E+000	1.13303E+002
Forklifts	8.38000E-003	7.78000E-002	8.50900E-002	1.10000E-004	5.15000E-003	4.74000E-003	0.00000E+000	9.90397E+000	9.90397E+000	3.20000E-003	0.00000E+000	9.98405E+000
Generator Sets	7.64000E-002	6.77980E-001	8.51880E-001	1.52000E-003	3.39900E-002	3.39900E-002	0.00000E+000	1.30987E+002	1.30987E+002	6.22000E-003	0.00000E+000	1.31142E+002
Graders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Other General Industrial Equipment	1.36300E-002	1.28750E-001	1.47600E-001	2.00000E-004	8.01000E-003	7.37000E-003	0.00000E+000	1.71561E+001	1.71561E+001	5.55000E-003	0.00000E+000	1.72948E+001
Other Material Handling Equipment	2.05200E-002	1.72270E-001	2.88910E-001	4.40000E-004	9.35000E-003	8.60000E-003	0.00000E+000	3.89683E+001	3.89683E+001	1.26000E-002	0.00000E+000	3.92833E+001
Pavers	3.54000E-003	3.49000E-002	4.78400E-002	8.00000E-005	1.82000E-003	1.67000E-003	0.00000E+000	6.62771E+000	6.62771E+000	2.14000E-003	0.00000E+000	6.68130E+000
Paving Equipment	2.25000E-003	2.13100E-002	3.32000E-002	5.00000E-005	1.04000E-003	9.50000E-004	0.00000E+000	4.65211E+000	4.65211E+000	1.50000E-003	0.00000E+000	4.68972E+000
Plate Compactors	4.70000E-004	2.95000E-003	2.47000E-003	1.00000E-005	1.10000E-004	1.10000E-004	0.00000E+000	3.67530E-001	3.67530E-001	4.00000E-005	0.00000E+000	3.68480E-001
Pumps	8.46800E-002	7.14270E-001	9.02070E-001	1.59000E-003	3.73000E-002	3.73000E-002	0.00000E+000	1.36639E+002	1.36639E+002	6.93000E-003	0.00000E+000	1.36812E+002
Rollers	6.92000E-003	7.14900E-002	9.07000E-002	1.30000E-004	3.86000E-003	3.55000E-003	0.00000E+000	1.16832E+001	1.16832E+001	3.78000E-003	0.00000E+000	1.17777E+001
Rubber Tired Dozers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Scrapers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Skid Steer Loaders	1.22000E-003	1.61600E-002	2.68800E-002	4.00000E-005	5.20000E-004	4.80000E-004	0.00000E+000	3.53209E+000	3.53209E+000	1.14000E-003	0.00000E+000	3.56065E+000
Surfacing Equipment	1.40000E-003	1.54200E-002	1.21900E-002	5.00000E-005	5.80000E-004	5.40000E-004	0.00000E+000	4.45234E+000	4.45234E+000	1.44000E-003	0.00000E+000	4.48834E+000
Tractors/Loaders/Backhoes	3.68900E-002	3.60820E-001	5.43880E-001	7.80000E-004	1.84500E-002	1.69800E-002	0.00000E+000	6.81988E+001	6.81988E+001	2.20600E-002	0.00000E+000	6.87502E+001
Welders	8.09000E-003	4.34800E-002	5.07000E-002	8.00000E-005	1.83000E-003	1.83000E-003	0.00000E+000	5.64661E+000	5.64661E+000	6.60000E-004	0.00000E+000	5.66303E+000

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Aerial Lifts	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000

Newell Creek Pipeline Construction - Near Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Air Compressors	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	2.93743E-006	2.93743E-006	0.00000E+000	0.00000E+000	0.00000E+000
Bore/Drill Rigs	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.25152E-006	1.25152E-006	0.00000E+000	0.00000E+000	1.10354E-006
Cement and Mortar Mixers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	3.41953E-006	3.41953E-006	0.00000E+000	0.00000E+000	3.41068E-006
Concrete/Industrial Saws	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.34048E-006	1.34048E-006	0.00000E+000	0.00000E+000	1.33888E-006
Cranes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Dumpers/Tenders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.90029E-006	1.90029E-006	0.00000E+000	0.00000E+000	1.89520E-006
Excavators	0.00000E+000	2.42471E-005	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.15664E-006	1.15664E-006	0.00000E+000	0.00000E+000	1.14736E-006
Forklifts	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.00970E-006	1.00970E-006	0.00000E+000	0.00000E+000	1.00160E-006
Generator Sets	0.00000E+000	1.47495E-005	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.22150E-006	1.22150E-006	0.00000E+000	0.00000E+000	1.22005E-006
Graders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Other General Industrial Equipment	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.16576E-006	1.16576E-006	0.00000E+000	0.00000E+000	1.15641E-006
Other Material Handling Equipment	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.02648E-006	1.02648E-006	0.00000E+000	0.00000E+000	1.27280E-006
Pavers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.50881E-006	1.50881E-006	0.00000E+000	0.00000E+000	1.49671E-006
Paving Equipment	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	2.13232E-006
Plate Compactors	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Pumps	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.17097E-006	1.17097E-006	0.00000E+000	0.00000E+000	1.16949E-006
Rollers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	8.55929E-007	8.55929E-007	0.00000E+000	0.00000E+000	1.69813E-006
Rubber Tired Dozers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Scrapers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Skid Steer Loaders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Surfacing Equipment	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	2.24600E-006	2.24600E-006	0.00000E+000	0.00000E+000	2.22799E-006
Tractors/Loaders/Backhoes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.31967E-006	1.31967E-006	0.00000E+000	0.00000E+000	1.16363E-006

Newell Creek Pipeline Construction - Near Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Welders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.77097E-006	1.77097E-006	0.00000E+000	0.00000E+000	1.76584E-006

Fugitive Dust Mitigation

Yes/No	Mitigation Measure	Mitigation Input		Mitigation Input		Mitigation Input	
No	Soil Stabilizer for unpaved Roads	PM10 Reduction	0.00	PM2.5 Reduction	0.00		
No	Replace Ground Cover of Area Disturbed	PM10 Reduction	0.00	PM2.5 Reduction	0.00		
Yes	Water Exposed Area	PM10 Reduction	55.00	PM2.5 Reduction	55.00	Frequency (per day)	2.00
No	Unpaved Road Mitigation	Moisture Content %	0.00	Vehicle Speed (mph)	0.00		
No	Clean Paved Road	% PM Reduction	0.00				

		Unmitigated		Mitigated		Percent Reduction	
Phase	Source	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Abandon Existing NCP: Inside Henry Cowell	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Abandon Existing NCP: Inside Henry Cowell	Roads	0.01	0.00	0.01	0.00	0.00	0.00
Abandon Existing NCP: Outside Henry Cowell	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Abandon Existing NCP: Outside Henry Cowell	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Big Trees RR Crossing: Backfill	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Big Trees RR Crossing: Backfill	Roads	0.00	0.00	0.00	0.00	0.00	0.00

Newell Creek Pipeline Construction - Near Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Big Trees RR Crossing: Boring and casing	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Big Trees RR Crossing: Boring and casing	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Big Trees RR Crossing: Grout	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Big Trees RR Crossing: Grout	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Big Trees RR Crossing: Pipe install	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Big Trees RR Crossing: Pipe install	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Big Trees RR Crossing: Shaft excavation	Fugitive Dust	0.00	0.00	0.00	0.00	1.00	0.00
Big Trees RR Crossing: Shaft excavation	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Abandon existing pipeline	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Abandon existing pipeline	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Carrier pipeline staging area prep	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Carrier pipeline staging area prep	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Demobilization	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Demobilization	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: HDD (North entry)	Fugitive Dust	0.00	0.00	0.00	0.00	0.50	1.00
Brackney North: HDD (North entry)	Roads	0.01	0.00	0.01	0.00	0.00	0.00
Brackney North: HDD (pullback)	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: HDD (pullback)	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: HDD (South entry)	Fugitive Dust	0.00	0.00	0.00	0.00	0.50	1.00
Brackney North: HDD (South entry)	Roads	0.10	0.03	0.10	0.03	0.00	0.00
Brackney North: Mobilization (North HDD pit)	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00

Newell Creek Pipeline Construction - Near Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Brackney North: Mobilization (North HDD pit)	Roads	0.04	0.01	0.04	0.01	0.00	0.00
Brackney North: Mobilization (South HDD pit)	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Mobilization (South HDD pit)	Roads	0.03	0.01	0.03	0.01	0.00	0.00
Brackney North: Restoration	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Restoration	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Tie-in pipeline construction	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Brackney North: Tie-in pipeline construction	Roads	0.01	0.00	0.01	0.00	0.00	0.00
FBPS to Zayante: Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
FBPS to Zayante: Paving	Roads	0.00	0.00	0.00	0.00	0.00	0.00
FBPS to Zayante: Road removal/pipe install	Fugitive Dust	0.00	0.00	0.00	0.00	0.56	0.67
FBPS to Zayante: Road removal/pipe install	Roads	0.01	0.00	0.01	0.00	0.00	0.00
GH Rd North: Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd North: Paving	Roads	0.01	0.00	0.01	0.00	0.00	0.00
GH Rd North: Pressure test	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd North: Pressure test	Roads	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd North: Road removal/pipe install	Fugitive Dust	0.00	0.00	0.00	0.00	0.55	0.55
GH Rd North: Road removal/pipe install	Roads	0.09	0.02	0.09	0.02	0.00	0.00
GH Rd North: Tie in to FBPS	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd North: Tie in to FBPS	Roads	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd South: Cathodic protection	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd South: Cathodic protection	Roads	0.00	0.00	0.00	0.00	0.00	0.00

Newell Creek Pipeline Construction - Near Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

GH Rd South: GHWTP tie in	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd South: GHWTP tie in	Roads	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd South: Pavement striping	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd South: Pavement striping	Roads	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd South: Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd South: Paving	Roads	0.01	0.00	0.01	0.00	0.00	0.00
GH Rd South: Road removal/pipe install	Fugitive Dust	0.00	0.00	0.00	0.00	0.55	0.54
GH Rd South: Road removal/pipe install	Roads	0.09	0.02	0.09	0.02	0.00	0.00
GH Rd South: Test pipeline	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
GH Rd South: Test pipeline	Roads	0.00	0.00	0.00	0.00	0.00	0.00
NCP FBPS to Graham Hill WTP: Staging area	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
NCP FBPS to Graham Hill WTP: Staging area	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: CIDH Piles	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: CIDH Piles	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: Grade for drainage	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: Grade for drainage	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: Install flex connect	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: Install flex connect	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: Install pipe span	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: Install pipe span	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: Pier scour protect	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00

Newell Creek Pipeline Construction - Near Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Zayante Creek Crossing: Pier scour protect	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: Pipe support	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Zayante Creek Crossing: Pipe support	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Zayante to Big Trees RR: Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Zayante to Big Trees RR: Paving	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Zayante to Big Trees RR: Road removal/pipe install	Fugitive Dust	0.00	0.00	0.00	0.00	0.55	0.50
Zayante to Big Trees RR: Road removal/pipe install	Roads	0.04	0.01	0.04	0.01	0.00	0.00

Operational Percent Reduction Summary

Category	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Indoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Outdoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Operational Mobile Mitigation

Newell Creek Pipeline Construction - Near Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Project Setting:

Mitigation	Category	Measure	% Reduction	Input Value 1	Input Value 2	Input Value 3
No	Land Use	Increase Density	0.00			
No	Land Use	Increase Diversity	0.00	0.15		
No	Land Use	Improve Walkability Design	0.00			
No	Land Use	Improve Destination Accessibility	0.00			
No	Land Use	Increase Transit Accessibility	0.25			
No	Land Use	Integrate Below Market Rate Housing	0.00			
	Land Use	Land Use SubTotal	0.00			
No	Neighborhood Enhancements	Improve Pedestrian Network				
No	Neighborhood Enhancements	Provide Traffic Calming Measures				
No	Neighborhood Enhancements	Implement NEV Network	0.00			
	Neighborhood Enhancements	Neighborhood Enhancements Subtotal	0.00			
No	Parking Policy Pricing	Limit Parking Supply	0.00			
No	Parking Policy Pricing	Unbundle Parking Costs	0.00			
No	Parking Policy Pricing	On-street Market Pricing	0.00			
	Parking Policy Pricing	Parking Policy Pricing Subtotal	0.00			
No	Transit Improvements	Provide BRT System	0.00			
No	Transit Improvements	Expand Transit Network	0.00			
No	Transit Improvements	Increase Transit Frequency	0.00			

Newell Creek Pipeline Construction - Near Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Transit Improvements	Transit Improvements Subtotal	0.00			
		Land Use and Site Enhancement Subtotal	0.00			
No	Commute	Implement Trip Reduction Program				
No	Commute	Transit Subsidy				
No	Commute	Implement Employee Parking "Cash Out"				
No	Commute	Workplace Parking Charge				
No	Commute	Encourage Telecommuting and Alternative Work Schedules	0.00			
No	Commute	Market Commute Trip Reduction Option	0.00			
No	Commute	Employee Vanpool/Shuttle	0.00		2.00	
No	Commute	Provide Ride Sharing Program				
	Commute	Commute Subtotal	0.00			
No	School Trip	Implement School Bus Program	0.00			
		Total VMT Reduction	0.00			

Area Mitigation

Measure Implemented	Mitigation Measure	Input Value
No	Only Natural Gas Hearth	
No	No Hearth	
No	Use Low VOC Cleaning Supplies	
No	Use Low VOC Paint (Residential Interior)	100.00
No	Use Low VOC Paint (Residential Exterior)	100.00

Newell Creek Pipeline Construction - Near Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

No	Use Low VOC Paint (Non-residential Interior)	150.00
No	Use Low VOC Paint (Non-residential Exterior)	150.00
No	Use Low VOC Paint (Parking)	150.00
No	% Electric Lawnmower	
No	% Electric Leafblower	
No	% Electric Chainsaw	

Energy Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Exceed Title 24		
No	Install High Efficiency Lighting		
No	On-site Renewable		

Appliance Type	Land Use Subtype	% Improvement
ClothWasher		30.00
DishWasher		15.00
Fan		50.00
Refrigerator		15.00

Water Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Apply Water Conservation on Strategy		

Newell Creek Pipeline Construction - Near Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

No	Use Reclaimed Water		
No	Use Grey Water		
No	Install low-flow bathroom faucet	32.00	
No	Install low-flow Kitchen faucet	18.00	
No	Install low-flow Toilet	20.00	
No	Install low-flow Shower	20.00	
No	Turf Reduction		
No	Use Water Efficient Irrigation Systems	6.10	
No	Water Efficient Landscape		

Solid Waste Mitigation

Mitigation Measures	Input Value
Institute Recycling and Composting Services Percent Reduction in Waste Disposed	

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Newell Creek Pipeline Construction - Long Term

Santa Cruz County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	9.93	Acre	9.93	432,550.80	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	1.8	**Precipitation Freq (Days)**	61
Climate Zone	5			**Operational Year**	2032
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Area to be paved conservatively based on total length (linear feet) of pipelines by 20 feet width (long term construction)

Construction Phase - Schedule based on SCWD input

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Trips and VMT - Based on input from SCWD

On-road Fugitive Dust - Default

Grading - Based on input from SCWD

Architectural Coating - Default

Vehicle Trips - Modeling construction only

Area Coating - Modeling construction only

Construction Off-road Equipment Mitigation - Water exposed areas 2x per day

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstructionPhase	NumDays	20.00	2.00
tblConstructionPhase	NumDays	20.00	1.00
tblConstructionPhase	NumDays	20.00	1.00
tblConstructionPhase	NumDays	20.00	40.00
tblConstructionPhase	NumDays	20.00	45.00
tblConstructionPhase	NumDays	20.00	40.00
tblConstructionPhase	NumDays	20.00	55.00
tblConstructionPhase	NumDays	20.00	85.00
tblConstructionPhase	NumDays	20.00	1.00

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	10.00	5.00
tblConstructionPhase	NumDays	10.00	5.00
tblConstructionPhase	NumDays	10.00	1.00
tblConstructionPhase	NumDays	10.00	3.00
tblGrading	AcresOfGrading	0.00	1.49
tblGrading	AcresOfGrading	0.00	1.95
tblGrading	AcresOfGrading	0.00	0.91
tblGrading	AcresOfGrading	0.00	2.31
tblGrading	AcresOfGrading	0.00	3.27
tblGrading	MaterialExported	0.00	4,483.00
tblGrading	MaterialExported	0.00	5,851.00
tblGrading	MaterialExported	0.00	2,717.00
tblGrading	MaterialExported	0.00	6,945.00
tblGrading	MaterialExported	0.00	9,820.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	560.00	1,199.00
tblTripsAndVMT	HaulingTripNumber	0.00	75.00
tblTripsAndVMT	HaulingTripNumber	731.00	1,565.00
tblTripsAndVMT	HaulingTripNumber	0.00	98.00
tblTripsAndVMT	HaulingTripNumber	340.00	727.00
tblTripsAndVMT	HaulingTripNumber	0.00	46.00
tblTripsAndVMT	HaulingTripNumber	868.00	1,857.00
tblTripsAndVMT	HaulingTripNumber	0.00	117.00
tblTripsAndVMT	HaulingTripNumber	1,228.00	2,626.00
tblTripsAndVMT	HaulingTripNumber	0.00	165.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	12.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	15.00
tblTripsAndVMT	VendorTripNumber	0.00	14.00
tblTripsAndVMT	VendorTripNumber	0.00	21.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripNumber	5.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	5.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	5.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	36.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	36.00	24.00
tblTripsAndVMT	WorkerTripNumber	5.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	36.00	24.00
tblTripsAndVMT	WorkerTripNumber	5.00	24.00

2.0 Emissions Summary

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2030	180.7438	9.6341	11.4736	0.0409	1.0399	0.2085	1.2101	0.2744	0.2066	0.4797	0.0000	4,198.3146	4,198.3146	0.1424	0.3917	4,316.5622
2031	90.5201	16.7934	17.6345	0.0727	1.9703	0.2941	2.2644	0.5345	0.2904	0.8248	0.0000	7,543.2005	7,543.2005	0.2626	0.7701	7,779.2593
Maximum	**180.7438**	**16.7934**	**17.6345**	**0.0727**	**1.9703**	**0.2941**	**2.2644**	**0.5345**	**0.2904**	**0.8248**	**0.0000**	**7,543.2005**	**7,543.2005**	**0.2626**	**0.7701**	**7,779.2593**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2030	180.7438	9.6341	11.4736	0.0409	1.0094	0.2085	1.2101	0.2731	0.2066	0.4797	0.0000	4,198.3146	4,198.3146	0.1424	0.3917	4,316.5622
2031	90.5201	16.7934	17.6345	0.0727	1.9703	0.2941	2.2644	0.5345	0.2904	0.8248	0.0000	7,543.2005	7,543.2005	0.2626	0.7701	7,779.2593
Maximum	**180.7438**	**16.7934**	**17.6345**	**0.0727**	**1.9703**	**0.2941**	**2.2644**	**0.5345**	**0.2904**	**0.8248**	**0.0000**	**7,543.2005**	**7,543.2005**	**0.2626**	**0.7701**	**7,779.2593**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	1.01	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1533	1.0000e-005	1.0100e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.1700e-003	2.1700e-003	1.0000e-005		2.3100e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1533**	**1.0000e-005**	**1.0100e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.1700e-003**	**2.1700e-003**	**1.0000e-005**	**0.0000**	**2.3100e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1533	1.0000e-005	1.0100e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.1700e-003	2.1700e-003	1.0000e-005		2.3100e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1533**	**1.0000e-005**	**1.0100e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.1700e-003**	**2.1700e-003**	**1.0000e-005**	**0.0000**	**2.3100e-003**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Newell Creek Rd Section: Staging and Mobilization	Site Preparation	3/4/2030	3/8/2030	5	5	
2	Newell Creek Rd Section: Pipeline Grading/ Install	Grading	3/11/2030	5/24/2030	5	55	
3	Newell Creek Rd Section: Paving	Paving	5/28/2030	6/3/2030	5	5	
4	Newell Creek Rd Section: Pavement Striping	Architectural Coating	6/4/2030	6/4/2030	5	1	
5	Glen Arbor Rd Section: Staging and Mobilization	Site Preparation	6/5/2030	6/7/2030	5	3	
6	Glen Arbor Rd Section: Pipeline Grading	Grading	6/10/2030	10/4/2030	5	85	
7	Glen Arbor Rd Section: Paving	Paving	10/7/2030	10/11/2030	5	5	
8	Glen Arbor Rd Section: Pavement Striping	Architectural Coating	10/14/2030	10/14/2030	5	1	
9	Brackney South Section: Staging and Mobilization	Site Preparation	3/3/2031	3/14/2031	5	10	
10	Brackney South Section: Pipeline Grading	Grading	3/17/2031	5/9/2031	5	40	
11	San Lorenzo Way Section: Staging and Mobilization	Site Preparation	5/12/2031	5/16/2031	5	5	
12	Brackney South Section: Paving	Paving	5/12/2031	5/12/2031	5	1	
13	San Lorenzo Way Section: Pipeline Grading	Grading	5/19/2031	7/18/2031	5	45	
14	San Lorenzo Way Section: Paving	Paving	7/21/2031	7/25/2031	5	5	
15	Felton Pump Station Section: Staging and Mobilization	Site Preparation	7/28/2031	7/28/2031	5	1	
16	Felton Pump Station Section: Grading	Grading	7/28/2031	9/19/2031	5	40	
17	Felton Pump Station Section: Paving	Paving	9/22/2031	9/26/2031	5	5	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

18	Felton Pump Station Section: Pavement Striping	Architectural Coating	9/29/2031	9/30/2031	5	2	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 2.31

Acres of Paving: 9.93

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 25,953 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Newell Creek Rd Section: Staging and Mobilization	Excavators	1	8.00	158	0.38
Newell Creek Rd Section: Staging and Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Newell Creek Rd Section: Staging and Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Newell Creek Rd Section: Pipeline Grading/ Install	Concrete/Industrial Saws	1	8.00	81	0.73
Newell Creek Rd Section: Pipeline Grading/ Install	Excavators	1	8.00	158	0.38
Newell Creek Rd Section: Pipeline Grading/ Install	Graders	0	8.00	187	0.41
Newell Creek Rd Section: Pipeline Grading/ Install	Rubber Tired Dozers	0	8.00	247	0.40
Newell Creek Rd Section: Pipeline Grading/ Install	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Newell Creek Rd Section: Paving	Pavers	1	8.00	130	0.42
Newell Creek Rd Section: Paving	Paving Equipment	1	8.00	132	0.36
Newell Creek Rd Section: Paving	Rollers	1	8.00	80	0.38
Newell Creek Rd Section: Pavement Striping	Air Compressors	0	6.00	78	0.48
Newell Creek Rd Section: Pavement Striping	Surfacing Equipment	1	8.00	263	0.30
Glen Arbor Rd Section: Staging and Mobilization	Excavators	1	8.00	158	0.38
Glen Arbor Rd Section: Staging and Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Glen Arbor Rd Section: Staging and Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Glen Arbor Rd Section: Pipeline Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Glen Arbor Rd Section: Pipeline Grading	Excavators	1	8.00	158	0.38
Glen Arbor Rd Section: Pipeline Grading	Graders	0	8.00	187	0.41
Glen Arbor Rd Section: Pipeline Grading	Rubber Tired Dozers	0	8.00	247	0.40
Glen Arbor Rd Section: Pipeline Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Glen Arbor Rd Section: Paving	Pavers	1	8.00	130	0.42
Glen Arbor Rd Section: Paving	Paving Equipment	1	8.00	132	0.36
Glen Arbor Rd Section: Paving	Rollers	1	8.00	80	0.38
Glen Arbor Rd Section: Pavement Striping	Air Compressors	0	6.00	78	0.48
Glen Arbor Rd Section: Pavement Striping	Surfacing Equipment	1	8.00	263	0.30
Brackney South Section: Staging and Mobilization	Excavators	1	8.00	158	0.38
Brackney South Section: Staging and Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Brackney South Section: Staging and Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Brackney South Section: Pipeline Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Brackney South Section: Pipeline Grading	Excavators	1	8.00	158	0.38
Brackney South Section: Pipeline Grading	Graders	0	8.00	187	0.41
Brackney South Section: Pipeline Grading	Rubber Tired Dozers	0	8.00	247	0.40
Brackney South Section: Pipeline Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Brackney South Section: Paving	Pavers	1	8.00	130	0.42
Brackney South Section: Paving	Paving Equipment	1	8.00	132	0.36
Brackney South Section: Paving	Rollers	1	8.00	80	0.38
San Lorenzo Way Section: Staging and Mobilization	Excavators	1	8.00	158	0.38
San Lorenzo Way Section: Staging and Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
San Lorenzo Way Section: Staging and Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
San Lorenzo Way Section: Pipeline Grading	Concrete/Industrial Saws	1	8.00	81	0.73

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

San Lorenzo Way Section: Pipeline Grading	Excavators	1	8.00	158	0.38
San Lorenzo Way Section: Pipeline Grading	Graders	0	8.00	187	0.41
San Lorenzo Way Section: Pipeline Grading	Rubber Tired Dozers	0	8.00	247	0.40
San Lorenzo Way Section: Pipeline Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
San Lorenzo Way Section: Paving	Pavers	1	8.00	130	0.42
San Lorenzo Way Section: Paving	Paving Equipment	1	8.00	132	0.36
San Lorenzo Way Section: Paving	Rollers	1	8.00	80	0.38
Felton Pump Station Section: Staging and Mobilization	Excavators	1	8.00	158	0.38
Felton Pump Station Section: Staging and Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Felton Pump Station Section: Staging and Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Felton Pump Station Section: Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Felton Pump Station Section: Grading	Excavators	1	8.00	158	0.38
Felton Pump Station Section: Grading	Graders	0	8.00	187	0.41
Felton Pump Station Section: Grading	Rubber Tired Dozers	0	8.00	247	0.40
Felton Pump Station Section: Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Felton Pump Station Section: Paving	Pavers	1	8.00	130	0.42
Felton Pump Station Section: Paving	Paving Equipment	1	8.00	132	0.36
Felton Pump Station Section: Paving	Rollers	1	8.00	80	0.38
Felton Pump Station Section: Pavement Striping	Air Compressors	0	6.00	78	0.48
Felton Pump Station Section: Pavement Striping	Surfacing Equipment	1	8.00	263	0.30

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Newell Creek Rd Section: Staging and	2	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Newell Creek Rd Section: Pipeline Grad	3	24.00	15.00	1,857.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Newell Creek Rd Section: Paving	3	24.00	14.00	117.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Newell Creek Rd Section: Pavement Str	1	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Glen Arbor Rd Section: Staging and	2	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Glen Arbor Rd Section: Pipeline Grad	3	24.00	21.00	2,626.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Glen Arbor Rd Section: Paving	3	24.00	20.00	165.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Glen Arbor Rd Section: Pavement Str	1	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney South Section: Staging and	2	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney South Section: Pipeline Grad	3	24.00	10.00	1,199.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney South Section: Paving	3	24.00	9.00	75.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
San Lorenzo Way Section: Staging and	2	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
San Lorenzo Way Section: Pipeline Grad	3	24.00	13.00	1,565.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
San Lorenzo Way Section: Paving	3	24.00	12.00	98.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Felton Pump Station Section: Staging and	2	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Felton Pump Station Section: Grading	3	24.00	6.00	727.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Felton Pump Station Section: Paving	3	24.00	6.00	46.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Felton Pump Station Section: Pavement Str	1	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Newell Creek Rd Section: Staging and Mobilization - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433		961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**		**961.5139**	**961.5139**	**0.0353**		**962.3967**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.0704**	**0.0388**	**0.6603**	**2.2300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**225.3016**	**225.3016**	**3.9100e-003**	**4.7300e-003**	**226.8099**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Newell Creek Rd Section: Staging and Mobilization - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433	0.0000	961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**961.5139**	**961.5139**	**0.0353**		**962.3967**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.0704**	**0.0388**	**0.6603**	**2.2300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**225.3016**	**225.3016**	**3.9100e-003**	**4.7300e-003**	**226.8099**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Newell Creek Rd Section: Pipeline Grading/ Install - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0555	0.0000	0.0555	6.4800e-003	0.0000	6.4800e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809		1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0555**	**0.0809**	**0.1364**	**6.4800e-003**	**0.0809**	**0.0874**		**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0834	5.2244	1.0982	0.0196	0.5863	0.0376	0.6239	0.1603	0.0360	0.1963		2,140.4724	2,140.4724	0.0701	0.3391	2,243.2893
Vendor	0.0157	0.6968	0.1806	2.5900e-003	0.0916	3.8500e-003	0.0954	0.0263	3.6800e-003	0.0300		278.3620	278.3620	5.7400e-003	0.0416	290.9063
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.1694**	**5.9599**	**1.9391**	**0.0244**	**0.9844**	**0.0427**	**1.0271**	**0.2679**	**0.0408**	**0.3088**		**2,644.1360**	**2,644.1360**	**0.0798**	**0.3855**	**2,761.0055**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Newell Creek Rd Section: Pipeline Grading/ Install - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0250	0.0000	0.0250	2.9100e-003	0.0000	2.9100e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809	0.0000	1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0250**	**0.0809**	**0.1059**	**2.9100e-003**	**0.0809**	**0.0838**	**0.0000**	**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0834	5.2244	1.0982	0.0196	0.5863	0.0376	0.6239	0.1603	0.0360	0.1963		2,140.4724	2,140.4724	0.0701	0.3391	2,243.2893
Vendor	0.0157	0.6968	0.1806	2.5900e-003	0.0916	3.8500e-003	0.0954	0.0263	3.6800e-003	0.0300		278.3620	278.3620	5.7400e-003	0.0416	290.9063
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.1694**	**5.9599**	**1.9391**	**0.0244**	**0.9844**	**0.0427**	**1.0271**	**0.2679**	**0.0408**	**0.3088**		**2,644.1360**	**2,644.1360**	**0.0798**	**0.3855**	**2,761.0055**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Newell Creek Rd Section: Paving - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653		1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**		**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0578	3.6208	0.7611	0.0136	0.4063	0.0261	0.4324	0.1111	0.0250	0.1361		1,483.4615	1,483.4615	0.0486	0.2350	1,554.7191
Vendor	0.0146	0.6503	0.1686	2.4200e-003	0.0855	3.5900e-003	0.0891	0.0246	3.4400e-003	0.0280		259.8045	259.8045	5.3500e-003	0.0388	271.5125
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.1428**	**4.3098**	**1.5899**	**0.0183**	**0.7983**	**0.0309**	**0.8292**	**0.2170**	**0.0295**	**0.2465**		**1,968.5676**	**1,968.5676**	**0.0578**	**0.2786**	**2,053.0415**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Newell Creek Rd Section: Paving - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653	0.0000	1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**	**0.0000**	**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0578	3.6208	0.7611	0.0136	0.4063	0.0261	0.4324	0.1111	0.0250	0.1361		1,483.4615	1,483.4615	0.0486	0.2350	1,554.7191
Vendor	0.0146	0.6503	0.1686	2.4200e-003	0.0855	3.5900e-003	0.0891	0.0246	3.4400e-003	0.0280		259.8045	259.8045	5.3500e-003	0.0388	271.5125
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.1428**	**4.3098**	**1.5899**	**0.0183**	**0.7983**	**0.0309**	**0.8292**	**0.2170**	**0.0295**	**0.2465**		**1,968.5676**	**1,968.5676**	**0.0578**	**0.2786**	**2,053.0415**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Newell Creek Rd Section: Pavement Striping - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	180.4382					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2352	1.0270	1.4361	6.9600e-003		0.0348	0.0348		0.0348	0.0348		790.8209	790.8209	0.0209		791.3427
Total	**180.6734**	**1.0270**	**1.4361**	**6.9600e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**		**790.8209**	**790.8209**	**0.0209**		**791.3427**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.0704**	**0.0388**	**0.6603**	**2.2300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**225.3016**	**225.3016**	**3.9100e-003**	**4.7300e-003**	**226.8099**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Newell Creek Rd Section: Pavement Striping - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	180.4382					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2352	1.0270	1.4361	6.9600e-003		0.0348	0.0348		0.0348	0.0348	0.0000	790.8209	790.8209	0.0209		791.3427
Total	**180.6734**	**1.0270**	**1.4361**	**6.9600e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**	**0.0000**	**790.8209**	**790.8209**	**0.0209**		**791.3427**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.0704**	**0.0388**	**0.6603**	**2.2300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**225.3016**	**225.3016**	**3.9100e-003**	**4.7300e-003**	**226.8099**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Glen Arbor Rd Section: Staging and Mobilization - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433		961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**		**961.5139**	**961.5139**	**0.0353**		**962.3967**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.0704**	**0.0388**	**0.6603**	**2.2300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**225.3016**	**225.3016**	**3.9100e-003**	**4.7300e-003**	**226.8099**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Glen Arbor Rd Section: Staging and Mobilization - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433	0.0000	961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**961.5139**	**961.5139**	**0.0353**		**962.3967**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.0704**	**0.0388**	**0.6603**	**2.2300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**225.3016**	**225.3016**	**3.9100e-003**	**4.7300e-003**	**226.8099**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Glen Arbor Rd Section: Pipeline Grading - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0509	0.0000	0.0509	5.9300e-003	0.0000	5.9300e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809		1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0509**	**0.0809**	**0.1318**	**5.9300e-003**	**0.0809**	**0.0868**		**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0763	4.7804	1.0049	0.0180	0.5364	0.0344	0.5709	0.1467	0.0330	0.1796		1,958.5570	1,958.5570	0.0641	0.3103	2,052.6356
Vendor	0.0220	0.9755	0.2529	3.6300e-003	0.1282	5.3900e-003	0.1336	0.0369	5.1500e-003	0.0420		389.7068	389.7068	8.0300e-003	0.0583	407.2688
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.1686**	**5.7946**	**1.9180**	**0.0238**	**0.9712**	**0.0411**	**1.0122**	**0.2649**	**0.0392**	**0.3041**		**2,573.5654**	**2,573.5654**	**0.0761**	**0.3733**	**2,686.7143**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Glen Arbor Rd Section: Pipeline Grading - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0229	0.0000	0.0229	2.6700e-003	0.0000	2.6700e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809	0.0000	1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0229**	**0.0809**	**0.1038**	**2.6700e-003**	**0.0809**	**0.0836**	**0.0000**	**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0763	4.7804	1.0049	0.0180	0.5364	0.0344	0.5709	0.1467	0.0330	0.1796		1,958.5570	1,958.5570	0.0641	0.3103	2,052.6356
Vendor	0.0220	0.9755	0.2529	3.6300e-003	0.1282	5.3900e-003	0.1336	0.0369	5.1500e-003	0.0420		389.7068	389.7068	8.0300e-003	0.0583	407.2688
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.1686**	**5.7946**	**1.9180**	**0.0238**	**0.9712**	**0.0411**	**1.0122**	**0.2649**	**0.0392**	**0.3041**		**2,573.5654**	**2,573.5654**	**0.0761**	**0.3733**	**2,686.7143**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Glen Arbor Rd Section: Paving - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653		1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**		**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0815	5.1063	1.0733	0.0192	0.5730	0.0368	0.6098	0.1567	0.0352	0.1919		2,092.0611	2,092.0611	0.0685	0.3315	2,192.5525
Vendor	0.0209	0.9290	0.2408	3.4500e-003	0.1221	5.1300e-003	0.1272	0.0351	4.9100e-003	0.0400		371.1493	371.1493	7.6500e-003	0.0555	387.8750
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.1728**	**6.0740**	**1.9744**	**0.0249**	**1.0016**	**0.0432**	**1.0448**	**0.2731**	**0.0413**	**0.3143**		**2,688.5120**	**2,688.5120**	**0.0801**	**0.3917**	**2,807.2375**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Glen Arbor Rd Section: Paving - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653	0.0000	1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**	**0.0000**	**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0815	5.1063	1.0733	0.0192	0.5730	0.0368	0.6098	0.1567	0.0352	0.1919		2,092.0611	2,092.0611	0.0685	0.3315	2,192.5525
Vendor	0.0209	0.9290	0.2408	3.4500e-003	0.1221	5.1300e-003	0.1272	0.0351	4.9100e-003	0.0400		371.1493	371.1493	7.6500e-003	0.0555	387.8750
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.1728**	**6.0740**	**1.9744**	**0.0249**	**1.0016**	**0.0432**	**1.0448**	**0.2731**	**0.0413**	**0.3143**		**2,688.5120**	**2,688.5120**	**0.0801**	**0.3917**	**2,807.2375**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.9 Glen Arbor Rd Section: Pavement Striping - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	180.4382					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2352	1.0270	1.4361	6.9600e-003		0.0348	0.0348		0.0348	0.0348		790.8209	790.8209	0.0209		791.3427
Total	**180.6734**	**1.0270**	**1.4361**	**6.9600e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**		**790.8209**	**790.8209**	**0.0209**		**791.3427**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.0704**	**0.0388**	**0.6603**	**2.2300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**225.3016**	**225.3016**	**3.9100e-003**	**4.7300e-003**	**226.8099**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.9 Glen Arbor Rd Section: Pavement Striping - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	180.4382					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2352	1.0270	1.4361	6.9600e-003		0.0348	0.0348		0.0348	0.0348	0.0000	790.8209	790.8209	0.0209		791.3427
Total	**180.6734**	**1.0270**	**1.4361**	**6.9600e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**	**0.0000**	**790.8209**	**790.8209**	**0.0209**		**791.3427**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0704	0.0388	0.6603	2.2300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		225.3016	225.3016	3.9100e-003	4.7300e-003	226.8099
Total	**0.0704**	**0.0388**	**0.6603**	**2.2300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**225.3016**	**225.3016**	**3.9100e-003**	**4.7300e-003**	**226.8099**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.10 Brackney South Section: Staging and Mobilization - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433		961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**		**961.5139**	**961.5139**	**0.0353**		**962.3967**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.0658**	**0.0356**	**0.6299**	**2.1800e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**220.3390**	**220.3390**	**3.6000e-003**	**4.5400e-003**	**221.7812**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.10 Brackney South Section: Staging and Mobilization - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433	0.0000	961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**961.5139**	**961.5139**	**0.0353**		**962.3967**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.0658**	**0.0356**	**0.6299**	**2.1800e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**220.3390**	**220.3390**	**3.6000e-003**	**4.5400e-003**	**221.7812**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.11 Brackney South Section: Pipeline Grading - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0493	0.0000	0.0493	5.7400e-003	0.0000	5.7400e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809		1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0493**	**0.0809**	**0.1302**	**5.7400e-003**	**0.0809**	**0.0866**		**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0718	4.4646	0.9740	0.0170	0.5205	0.0323	0.5528	0.1423	0.0309	0.1733		1,857.9922	1,857.9922	0.0617	0.2944	1,947.2597
Vendor	0.0102	0.4525	0.1196	1.7000e-003	0.0611	2.4900e-003	0.0635	0.0176	2.3800e-003	0.0199		182.1063	182.1063	3.7900e-003	0.0272	190.3066
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.1477**	**4.9528**	**1.7234**	**0.0209**	**0.8881**	**0.0360**	**0.9241**	**0.2412**	**0.0344**	**0.2756**		**2,260.4375**	**2,260.4375**	**0.0691**	**0.3261**	**2,359.3474**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.11 Brackney South Section: Pipeline Grading - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0222	0.0000	0.0222	2.5800e-003	0.0000	2.5800e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809	0.0000	1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0222**	**0.0809**	**0.1031**	**2.5800e-003**	**0.0809**	**0.0835**	**0.0000**	**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0718	4.4646	0.9740	0.0170	0.5205	0.0323	0.5528	0.1423	0.0309	0.1733		1,857.9922	1,857.9922	0.0617	0.2944	1,947.2597
Vendor	0.0102	0.4525	0.1196	1.7000e-003	0.0611	2.4900e-003	0.0635	0.0176	2.3800e-003	0.0199		182.1063	182.1063	3.7900e-003	0.0272	190.3066
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.1477**	**4.9528**	**1.7234**	**0.0209**	**0.8881**	**0.0360**	**0.9241**	**0.2412**	**0.0344**	**0.2756**		**2,260.4375**	**2,260.4375**	**0.0691**	**0.3261**	**2,359.3474**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.12 San Lorenzo Way Section: Staging and Mobilization - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433		961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**		**961.5139**	**961.5139**	**0.0353**		**962.3967**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.0658**	**0.0356**	**0.6299**	**2.1800e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**220.3390**	**220.3390**	**3.6000e-003**	**4.5400e-003**	**221.7812**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.12 San Lorenzo Way Section: Staging and Mobilization - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433	0.0000	961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**961.5139**	**961.5139**	**0.0353**		**962.3967**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.0658**	**0.0356**	**0.6299**	**2.1800e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**220.3390**	**220.3390**	**3.6000e-003**	**4.5400e-003**	**221.7812**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.13 Brackney South Section: Paving - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653		1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	26.0166					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**26.7089**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**		**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1796	11.1709	2.4371	0.0426	1.3023	0.0809	1.3832	0.3561	0.0774	0.4335		4,648.8545	4,648.8545	0.1544	0.7366	4,872.2094
Vendor	9.1300e-003	0.4072	0.1076	1.5300e-003	0.0549	2.2400e-003	0.0572	0.0158	2.1400e-003	0.0179		163.8957	163.8957	3.4100e-003	0.0245	171.2759
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.2545**	**11.6138**	**3.1745**	**0.0463**	**1.6638**	**0.0843**	**1.7481**	**0.4532**	**0.0806**	**0.5338**		**5,033.0892**	**5,033.0892**	**0.1614**	**0.7656**	**5,265.2664**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.13 Brackney South Section: Paving - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653	0.0000	1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	26.0166					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**26.7089**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**	**0.0000**	**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1796	11.1709	2.4371	0.0426	1.3023	0.0809	1.3832	0.3561	0.0774	0.4335		4,648.8545	4,648.8545	0.1544	0.7366	4,872.2094
Vendor	9.1300e-003	0.4072	0.1076	1.5300e-003	0.0549	2.2400e-003	0.0572	0.0158	2.1400e-003	0.0179		163.8957	163.8957	3.4100e-003	0.0245	171.2759
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.2545**	**11.6138**	**3.1745**	**0.0463**	**1.6638**	**0.0843**	**1.7481**	**0.4532**	**0.0806**	**0.5338**		**5,033.0892**	**5,033.0892**	**0.1614**	**0.7656**	**5,265.2664**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.14 San Lorenzo Way Section: Pipeline Grading - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0573	0.0000	0.0573	6.6800e-003	0.0000	6.6800e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809		1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0573**	**0.0809**	**0.1382**	**6.6800e-003**	**0.0809**	**0.0876**		**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0833	5.1800	1.1301	0.0198	0.6039	0.0375	0.6414	0.1651	0.0359	0.2010		2,155.6910	2,155.6910	0.0716	0.3416	2,259.2615
Vendor	0.0132	0.5882	0.1554	2.2000e-003	0.0794	3.2300e-003	0.0826	0.0228	3.0900e-003	0.0259		236.7382	236.7382	4.9200e-003	0.0354	247.3985
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.1623**	**5.8039**	**1.9154**	**0.0241**	**0.9898**	**0.0419**	**1.0317**	**0.2693**	**0.0401**	**0.3093**		**2,612.7683**	**2,612.7683**	**0.0801**	**0.3815**	**2,728.4412**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.14 San Lorenzo Way Section: Pipeline Grading - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0258	0.0000	0.0258	3.0000e-003	0.0000	3.0000e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809	0.0000	1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0258**	**0.0809**	**0.1067**	**3.0000e-003**	**0.0809**	**0.0839**	**0.0000**	**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0833	5.1800	1.1301	0.0198	0.6039	0.0375	0.6414	0.1651	0.0359	0.2010		2,155.6910	2,155.6910	0.0716	0.3416	2,259.2615
Vendor	0.0132	0.5882	0.1554	2.2000e-003	0.0794	3.2300e-003	0.0826	0.0228	3.0900e-003	0.0259		236.7382	236.7382	4.9200e-003	0.0354	247.3985
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.1623**	**5.8039**	**1.9154**	**0.0241**	**0.9898**	**0.0419**	**1.0317**	**0.2693**	**0.0401**	**0.3093**		**2,612.7683**	**2,612.7683**	**0.0801**	**0.3815**	**2,728.4412**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.15 San Lorenzo Way Section: Paving - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653		1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**		**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0469	2.9193	0.6369	0.0111	0.3403	0.0212	0.3615	0.0931	0.0202	0.1133		1,214.9006	1,214.9006	0.0404	0.1925	1,273.2707
Vendor	0.0122	0.5430	0.1435	2.0300e-003	0.0733	2.9800e-003	0.0762	0.0211	2.8500e-003	0.0239		218.5276	218.5276	4.5400e-003	0.0326	228.3679
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.1249**	**3.4979**	**1.4102**	**0.0153**	**0.7201**	**0.0253**	**0.7454**	**0.1954**	**0.0242**	**0.2196**		**1,653.7672**	**1,653.7672**	**0.0485**	**0.2297**	**1,723.4197**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.15 San Lorenzo Way Section: Paving - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653	0.0000	1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**	**0.0000**	**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0469	2.9193	0.6369	0.0111	0.3403	0.0212	0.3615	0.0931	0.0202	0.1133		1,214.9006	1,214.9006	0.0404	0.1925	1,273.2707
Vendor	0.0122	0.5430	0.1435	2.0300e-003	0.0733	2.9800e-003	0.0762	0.0211	2.8500e-003	0.0239		218.5276	218.5276	4.5400e-003	0.0326	228.3679
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.1249**	**3.4979**	**1.4102**	**0.0153**	**0.7201**	**0.0253**	**0.7454**	**0.1954**	**0.0242**	**0.2196**		**1,653.7672**	**1,653.7672**	**0.0485**	**0.2297**	**1,723.4197**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.16 Felton Pump Station Section: Staging and Mobilization - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433		961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**		**961.5139**	**961.5139**	**0.0353**		**962.3967**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.0658**	**0.0356**	**0.6299**	**2.1800e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**220.3390**	**220.3390**	**3.6000e-003**	**4.5400e-003**	**221.7812**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.16 Felton Pump Station Section: Staging and Mobilization - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433	0.0000	961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**961.5139**	**961.5139**	**0.0353**		**962.3967**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.0658**	**0.0356**	**0.6299**	**2.1800e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**220.3390**	**220.3390**	**3.6000e-003**	**4.5400e-003**	**221.7812**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.17 Felton Pump Station Section: Grading - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0300	0.0000	0.0300	3.5000e-003	0.0000	3.5000e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809		1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0300**	**0.0809**	**0.1109**	**3.5000e-003**	**0.0809**	**0.0844**		**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0435	2.7071	0.5906	0.0103	0.3156	0.0196	0.3352	0.0863	0.0188	0.1051		1,126.5724	1,126.5724	0.0374	0.1785	1,180.6987
Vendor	6.0900e-003	0.2715	0.0717	1.0200e-003	0.0366	1.4900e-003	0.0381	0.0105	1.4300e-003	0.0120		109.2638	109.2638	2.2700e-003	0.0163	114.1839
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.1154**	**3.0142**	**1.2922**	**0.0135**	**0.6588**	**0.0223**	**0.6810**	**0.1781**	**0.0213**	**0.1994**		**1,456.1752**	**1,456.1752**	**0.0433**	**0.1994**	**1,516.6638**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.17 Felton Pump Station Section: Grading - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0135	0.0000	0.0135	1.5800e-003	0.0000	1.5800e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809	0.0000	1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0135**	**0.0809**	**0.0944**	**1.5800e-003**	**0.0809**	**0.0825**	**0.0000**	**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0435	2.7071	0.5906	0.0103	0.3156	0.0196	0.3352	0.0863	0.0188	0.1051		1,126.5724	1,126.5724	0.0374	0.1785	1,180.6987
Vendor	6.0900e-003	0.2715	0.0717	1.0200e-003	0.0366	1.4900e-003	0.0381	0.0105	1.4300e-003	0.0120		109.2638	109.2638	2.2700e-003	0.0163	114.1839
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.1154**	**3.0142**	**1.2922**	**0.0135**	**0.6588**	**0.0223**	**0.6810**	**0.1781**	**0.0213**	**0.1994**		**1,456.1752**	**1,456.1752**	**0.0433**	**0.1994**	**1,516.6638**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.18 Felton Pump Station Section: Paving - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653		1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**		**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0220	1.3703	0.2990	5.2300e-003	0.1597	9.9300e-003	0.1697	0.0437	9.5000e-003	0.0532		570.2595	570.2595	0.0189	0.0904	597.6577
Vendor	6.0900e-003	0.2715	0.0717	1.0200e-003	0.0366	1.4900e-003	0.0381	0.0105	1.4300e-003	0.0120		109.2638	109.2638	2.2700e-003	0.0163	114.1839
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.0939**	**1.6774**	**1.0006**	**8.4300e-003**	**0.5029**	**0.0126**	**0.5155**	**0.1355**	**0.0120**	**0.1475**		**899.8623**	**899.8623**	**0.0248**	**0.1112**	**933.6228**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.18 Felton Pump Station Section: Paving - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653	0.0000	1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**	**0.0000**	**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0220	1.3703	0.2990	5.2300e-003	0.1597	9.9300e-003	0.1697	0.0437	9.5000e-003	0.0532		570.2595	570.2595	0.0189	0.0904	597.6577
Vendor	6.0900e-003	0.2715	0.0717	1.0200e-003	0.0366	1.4900e-003	0.0381	0.0105	1.4300e-003	0.0120		109.2638	109.2638	2.2700e-003	0.0163	114.1839
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.0939**	**1.6774**	**1.0006**	**8.4300e-003**	**0.5029**	**0.0126**	**0.5155**	**0.1355**	**0.0120**	**0.1475**		**899.8623**	**899.8623**	**0.0248**	**0.1112**	**933.6228**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.19 Felton Pump Station Section: Pavement Striping - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	90.2191					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2352	1.0270	1.4361	6.9600e-003		0.0348	0.0348		0.0348	0.0348		790.8209	790.8209	0.0209		791.3427
Total	**90.4543**	**1.0270**	**1.4361**	**6.9600e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**		**790.8209**	**790.8209**	**0.0209**		**791.3427**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.0658**	**0.0356**	**0.6299**	**2.1800e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**220.3390**	**220.3390**	**3.6000e-003**	**4.5400e-003**	**221.7812**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.19 Felton Pump Station Section: Pavement Striping - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	90.2191					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2352	1.0270	1.4361	6.9600e-003		0.0348	0.0348		0.0348	0.0348	0.0000	790.8209	790.8209	0.0209		791.3427
Total	**90.4543**	**1.0270**	**1.4361**	**6.9600e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**	**0.0000**	**790.8209**	**790.8209**	**0.0209**		**791.3427**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0658	0.0356	0.6299	2.1800e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		220.3390	220.3390	3.6000e-003	4.5400e-003	221.7812
Total	**0.0658**	**0.0356**	**0.6299**	**2.1800e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**220.3390**	**220.3390**	**3.6000e-003**	**4.5400e-003**	**221.7812**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.552058	0.056962	0.193821	0.123008	0.021404	0.005318	0.010231	0.003525	0.000574	0.000778	0.028458	0.000952	0.002912

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1533	1.0000e-005	1.0100e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.1700e-003	2.1700e-003	1.0000e-005		2.3100e-003
Unmitigated	0.1533	1.0000e-005	1.0100e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.1700e-003	2.1700e-003	1.0000e-005		2.3100e-003

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1532					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.0000e-005	1.0000e-005	1.0100e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.1700e-003	2.1700e-003	1.0000e-005		2.3100e-003
Total	**0.1533**	**1.0000e-005**	**1.0100e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.1700e-003**	**2.1700e-003**	**1.0000e-005**		**2.3100e-003**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1532					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.0000e-005	1.0000e-005	1.0100e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.1700e-003	2.1700e-003	1.0000e-005		2.3100e-003
Total	**0.1533**	**1.0000e-005**	**1.0100e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.1700e-003**	**2.1700e-003**	**1.0000e-005**		**2.3100e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Newell Creek Pipeline Construction - Long Term

Santa Cruz County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	9.93	Acre	9.93	432,550.80	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	1.8	**Precipitation Freq (Days)**	61
Climate Zone	5			**Operational Year**	2032
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Area to be paved conservatively based on total length (linear feet) of pipelines by 20 feet width (long term construction)

Construction Phase - Schedule based on SCWD input

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Trips and VMT - Based on input from SCWD

On-road Fugitive Dust - Default

Grading - Based on input from SCWD

Architectural Coating - Default

Vehicle Trips - Modeling construction only

Area Coating - Modeling construction only

Construction Off-road Equipment Mitigation - Water exposed areas 2x per day

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstructionPhase	NumDays	20.00	2.00
tblConstructionPhase	NumDays	20.00	1.00
tblConstructionPhase	NumDays	20.00	1.00
tblConstructionPhase	NumDays	20.00	40.00
tblConstructionPhase	NumDays	20.00	45.00
tblConstructionPhase	NumDays	20.00	40.00
tblConstructionPhase	NumDays	20.00	55.00
tblConstructionPhase	NumDays	20.00	85.00
tblConstructionPhase	NumDays	20.00	1.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	10.00	5.00
tblConstructionPhase	NumDays	10.00	5.00
tblConstructionPhase	NumDays	10.00	1.00
tblConstructionPhase	NumDays	10.00	3.00
tblGrading	AcresOfGrading	0.00	1.49
tblGrading	AcresOfGrading	0.00	1.95
tblGrading	AcresOfGrading	0.00	0.91
tblGrading	AcresOfGrading	0.00	2.31
tblGrading	AcresOfGrading	0.00	3.27
tblGrading	MaterialExported	0.00	4,483.00
tblGrading	MaterialExported	0.00	5,851.00
tblGrading	MaterialExported	0.00	2,717.00
tblGrading	MaterialExported	0.00	6,945.00
tblGrading	MaterialExported	0.00	9,820.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	560.00	1,199.00
tblTripsAndVMT	HaulingTripNumber	0.00	75.00
tblTripsAndVMT	HaulingTripNumber	731.00	1,565.00
tblTripsAndVMT	HaulingTripNumber	0.00	98.00
tblTripsAndVMT	HaulingTripNumber	340.00	727.00
tblTripsAndVMT	HaulingTripNumber	0.00	46.00
tblTripsAndVMT	HaulingTripNumber	868.00	1,857.00
tblTripsAndVMT	HaulingTripNumber	0.00	117.00
tblTripsAndVMT	HaulingTripNumber	1,228.00	2,626.00
tblTripsAndVMT	HaulingTripNumber	0.00	165.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	12.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	15.00
tblTripsAndVMT	VendorTripNumber	0.00	14.00
tblTripsAndVMT	VendorTripNumber	0.00	21.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripNumber	5.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	5.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	5.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	36.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	36.00	24.00
tblTripsAndVMT	WorkerTripNumber	5.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	36.00	24.00
tblTripsAndVMT	WorkerTripNumber	5.00	24.00

2.0 Emissions Summary

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2030	180.7539	9.9271	11.4890	0.0408	1.0399	0.2086	1.2102	0.2744	0.2067	0.4798	0.0000	4,190.4857	4,190.4857	0.1425	0.3928	4,309.0531
2031	90.5297	17.3579	17.6594	0.0725	1.9703	0.2943	2.2646	0.5345	0.2905	0.8250	0.0000	7,527.9590	7,527.9590	0.2628	0.7722	7,764.6282
Maximum	**180.7539**	**17.3579**	**17.6594**	**0.0725**	**1.9703**	**0.2943**	**2.2646**	**0.5345**	**0.2905**	**0.8250**	**0.0000**	**7,527.9590**	**7,527.9590**	**0.2628**	**0.7722**	**7,764.6282**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2030	180.7539	9.9271	11.4890	0.0408	1.0094	0.2086	1.2102	0.2731	0.2067	0.4798	0.0000	4,190.4857	4,190.4857	0.1425	0.3928	4,309.0531
2031	90.5297	17.3579	17.6594	0.0725	1.9703	0.2943	2.2646	0.5345	0.2905	0.8250	0.0000	7,527.9590	7,527.9590	0.2628	0.7722	7,764.6281
Maximum	**180.7539**	**17.3579**	**17.6594**	**0.0725**	**1.9703**	**0.2943**	**2.2646**	**0.5345**	**0.2905**	**0.8250**	**0.0000**	**7,527.9590**	**7,527.9590**	**0.2628**	**0.7722**	**7,764.6281**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	1.01	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1533	1.0000e-005	1.0100e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.1700e-003	2.1700e-003	1.0000e-005		2.3100e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1533**	**1.0000e-005**	**1.0100e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.1700e-003**	**2.1700e-003**	**1.0000e-005**	**0.0000**	**2.3100e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.1533	1.0000e-005	1.0100e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.1700e-003	2.1700e-003	1.0000e-005		2.3100e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1533**	**1.0000e-005**	**1.0100e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.1700e-003**	**2.1700e-003**	**1.0000e-005**	**0.0000**	**2.3100e-003**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Newell Creek Rd Section: Staging and Mobilization	Site Preparation	3/4/2030	3/8/2030	5	5	
2	Newell Creek Rd Section: Pipeline Grading/ Install	Grading	3/11/2030	5/24/2030	5	55	
3	Newell Creek Rd Section: Paving	Paving	5/28/2030	6/3/2030	5	5	
4	Newell Creek Rd Section: Pavement Striping	Architectural Coating	6/4/2030	6/4/2030	5	1	
5	Glen Arbor Rd Section: Staging and Mobilization	Site Preparation	6/5/2030	6/7/2030	5	3	
6	Glen Arbor Rd Section: Pipeline Grading	Grading	6/10/2030	10/4/2030	5	85	
7	Glen Arbor Rd Section: Paving	Paving	10/7/2030	10/11/2030	5	5	
8	Glen Arbor Rd Section: Pavement Striping	Architectural Coating	10/14/2030	10/14/2030	5	1	
9	Brackney South Section: Staging and Mobilization	Site Preparation	3/3/2031	3/14/2031	5	10	
10	Brackney South Section: Pipeline Grading	Grading	3/17/2031	5/9/2031	5	40	
11	San Lorenzo Way Section: Staging and Mobilization	Site Preparation	5/12/2031	5/16/2031	5	5	
12	Brackney South Section: Paving	Paving	5/12/2031	5/12/2031	5	1	
13	San Lorenzo Way Section: Pipeline Grading	Grading	5/19/2031	7/18/2031	5	45	
14	San Lorenzo Way Section: Paving	Paving	7/21/2031	7/25/2031	5	5	
15	Felton Pump Station Section: Staging and Mobilization	Site Preparation	7/28/2031	7/28/2031	5	1	
16	Felton Pump Station Section: Grading	Grading	7/28/2031	9/19/2031	5	40	
17	Felton Pump Station Section: Paving	Paving	9/22/2031	9/26/2031	5	5	

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

18	Felton Pump Station Section: Pavement Striping	Architectural Coating	9/29/2031	9/30/2031	5	2	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 2.31

Acres of Paving: 9.93

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 25,953 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Newell Creek Rd Section: Staging and Mobilization	Excavators	1	8.00	158	0.38
Newell Creek Rd Section: Staging and Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Newell Creek Rd Section: Staging and Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Newell Creek Rd Section: Pipeline Grading/ Install	Concrete/Industrial Saws	1	8.00	81	0.73
Newell Creek Rd Section: Pipeline Grading/ Install	Excavators	1	8.00	158	0.38
Newell Creek Rd Section: Pipeline Grading/ Install	Graders	0	8.00	187	0.41
Newell Creek Rd Section: Pipeline Grading/ Install	Rubber Tired Dozers	0	8.00	247	0.40
Newell Creek Rd Section: Pipeline Grading/ Install	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Newell Creek Rd Section: Paving	Pavers	1	8.00	130	0.42
Newell Creek Rd Section: Paving	Paving Equipment	1	8.00	132	0.36
Newell Creek Rd Section: Paving	Rollers	1	8.00	80	0.38
Newell Creek Rd Section: Pavement Striping	Air Compressors	0	6.00	78	0.48
Newell Creek Rd Section: Pavement Striping	Surfacing Equipment	1	8.00	263	0.30
Glen Arbor Rd Section: Staging and Mobilization	Excavators	1	8.00	158	0.38
Glen Arbor Rd Section: Staging and Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Glen Arbor Rd Section: Staging and Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Glen Arbor Rd Section: Pipeline Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Glen Arbor Rd Section: Pipeline Grading	Excavators	1	8.00	158	0.38
Glen Arbor Rd Section: Pipeline Grading	Graders	0	8.00	187	0.41
Glen Arbor Rd Section: Pipeline Grading	Rubber Tired Dozers	0	8.00	247	0.40
Glen Arbor Rd Section: Pipeline Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Glen Arbor Rd Section: Paving	Pavers	1	8.00	130	0.42
Glen Arbor Rd Section: Paving	Paving Equipment	1	8.00	132	0.36
Glen Arbor Rd Section: Paving	Rollers	1	8.00	80	0.38
Glen Arbor Rd Section: Pavement Striping	Air Compressors	0	6.00	78	0.48
Glen Arbor Rd Section: Pavement Striping	Surfacing Equipment	1	8.00	263	0.30
Brackney South Section: Staging and Mobilization	Excavators	1	8.00	158	0.38
Brackney South Section: Staging and Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Brackney South Section: Staging and Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Brackney South Section: Pipeline Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Brackney South Section: Pipeline Grading	Excavators	1	8.00	158	0.38
Brackney South Section: Pipeline Grading	Graders	0	8.00	187	0.41
Brackney South Section: Pipeline Grading	Rubber Tired Dozers	0	8.00	247	0.40
Brackney South Section: Pipeline Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Brackney South Section: Paving	Pavers	1	8.00	130	0.42
Brackney South Section: Paving	Paving Equipment	1	8.00	132	0.36
Brackney South Section: Paving	Rollers	1	8.00	80	0.38
San Lorenzo Way Section: Staging and Mobilization	Excavators	1	8.00	158	0.38
San Lorenzo Way Section: Staging and Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
San Lorenzo Way Section: Staging and Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
San Lorenzo Way Section: Pipeline Grading	Concrete/Industrial Saws	1	8.00	81	0.73

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

San Lorenzo Way Section: Pipeline Grading	Excavators	1	8.00	158	0.38
San Lorenzo Way Section: Pipeline Grading	Graders	0	8.00	187	0.41
San Lorenzo Way Section: Pipeline Grading	Rubber Tired Dozers	0	8.00	247	0.40
San Lorenzo Way Section: Pipeline Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
San Lorenzo Way Section: Paving	Pavers	1	8.00	130	0.42
San Lorenzo Way Section: Paving	Paving Equipment	1	8.00	132	0.36
San Lorenzo Way Section: Paving	Rollers	1	8.00	80	0.38
Felton Pump Station Section: Staging and Mobilization	Excavators	1	8.00	158	0.38
Felton Pump Station Section: Staging and Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Felton Pump Station Section: Staging and Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Felton Pump Station Section: Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Felton Pump Station Section: Grading	Excavators	1	8.00	158	0.38
Felton Pump Station Section: Grading	Graders	0	8.00	187	0.41
Felton Pump Station Section: Grading	Rubber Tired Dozers	0	8.00	247	0.40
Felton Pump Station Section: Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Felton Pump Station Section: Paving	Pavers	1	8.00	130	0.42
Felton Pump Station Section: Paving	Paving Equipment	1	8.00	132	0.36
Felton Pump Station Section: Paving	Rollers	1	8.00	80	0.38
Felton Pump Station Section: Pavement Striping	Air Compressors	0	6.00	78	0.48
Felton Pump Station Section: Pavement Striping	Surfacing Equipment	1	8.00	263	0.30

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Newell Creek Rd Section: Staging and	2	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Newell Creek Rd Section: Pipeline Grad	3	24.00	15.00	1,857.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Newell Creek Rd Section: Paving	3	24.00	14.00	117.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Newell Creek Rd Section: Pavement Str	1	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Glen Arbor Rd Section: Staging and	2	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Glen Arbor Rd Section: Pipeline Grad	3	24.00	21.00	2,626.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Glen Arbor Rd Section: Paving	3	24.00	20.00	165.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Glen Arbor Rd Section: Pavement Str	1	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney South Section: Staging and	2	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney South Section: Pipeline Grad	3	24.00	10.00	1,199.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney South Section: Paving	3	24.00	9.00	75.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
San Lorenzo Way Section: Staging and	2	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
San Lorenzo Way Section: Pipeline Grad	3	24.00	13.00	1,565.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
San Lorenzo Way Section: Paving	3	24.00	12.00	98.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Felton Pump Station Section: Staging and	2	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Felton Pump Station Section: Grading	3	24.00	6.00	727.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Felton Pump Station Section: Paving	3	24.00	6.00	46.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Felton Pump Station Section: Pavement Str	1	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Newell Creek Rd Section: Staging and Mobilization - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433		961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**		**961.5139**	**961.5139**	**0.0353**		**962.3967**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.0805**	**0.0481**	**0.6561**	**2.1300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**215.7968**	**215.7968**	**4.3000e-003**	**5.4700e-003**	**217.5334**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Newell Creek Rd Section: Staging and Mobilization - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433	0.0000	961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**961.5139**	**961.5139**	**0.0353**		**962.3967**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.0805**	**0.0481**	**0.6561**	**2.1300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**215.7968**	**215.7968**	**4.3000e-003**	**5.4700e-003**	**217.5334**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Newell Creek Rd Section: Pipeline Grading/ Install - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0555	0.0000	0.0555	6.4800e-003	0.0000	6.4800e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809		1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0555**	**0.0809**	**0.1364**	**6.4800e-003**	**0.0809**	**0.0874**		**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0794	5.4700	1.1111	0.0196	0.5863	0.0377	0.6240	0.1603	0.0361	0.1964		2,141.8336	2,141.8336	0.0699	0.3394	2,244.7195
Vendor	0.0153	0.7295	0.1873	2.5900e-003	0.0916	3.8700e-003	0.0954	0.0263	3.7000e-003	0.0300		278.6767	278.6767	5.7000e-003	0.0417	291.2435
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.1751**	**6.2476**	**1.9544**	**0.0244**	**0.9844**	**0.0428**	**1.0272**	**0.2679**	**0.0409**	**0.3089**		**2,636.3072**	**2,636.3072**	**0.0799**	**0.3866**	**2,753.4964**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Newell Creek Rd Section: Pipeline Grading/ Install - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0250	0.0000	0.0250	2.9100e-003	0.0000	2.9100e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809	0.0000	1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0250**	**0.0809**	**0.1059**	**2.9100e-003**	**0.0809**	**0.0838**	**0.0000**	**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0794	5.4700	1.1111	0.0196	0.5863	0.0377	0.6240	0.1603	0.0361	0.1964		2,141.8336	2,141.8336	0.0699	0.3394	2,244.7195
Vendor	0.0153	0.7295	0.1873	2.5900e-003	0.0916	3.8700e-003	0.0954	0.0263	3.7000e-003	0.0300		278.6767	278.6767	5.7000e-003	0.0417	291.2435
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.1751**	**6.2476**	**1.9544**	**0.0244**	**0.9844**	**0.0428**	**1.0272**	**0.2679**	**0.0409**	**0.3089**		**2,636.3072**	**2,636.3072**	**0.0799**	**0.3866**	**2,753.4964**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Newell Creek Rd Section: Paving - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653		1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**		**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0550	3.7910	0.7700	0.0136	0.4063	0.0262	0.4325	0.1111	0.0250	0.1361		1,484.4049	1,484.4049	0.0484	0.2352	1,555.7103
Vendor	0.0143	0.6808	0.1748	2.4200e-003	0.0855	3.6100e-003	0.0891	0.0246	3.4600e-003	0.0280		260.0983	260.0983	5.3200e-003	0.0389	271.8273
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.1497**	**4.5200**	**1.6009**	**0.0182**	**0.7983**	**0.0310**	**0.8293**	**0.2170**	**0.0296**	**0.2466**		**1,960.3000**	**1,960.3000**	**0.0580**	**0.2796**	**2,045.0709**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Newell Creek Rd Section: Paving - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653	0.0000	1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**	**0.0000**	**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0550	3.7910	0.7700	0.0136	0.4063	0.0262	0.4325	0.1111	0.0250	0.1361		1,484.4049	1,484.4049	0.0484	0.2352	1,555.7103
Vendor	0.0143	0.6808	0.1748	2.4200e-003	0.0855	3.6100e-003	0.0891	0.0246	3.4600e-003	0.0280		260.0983	260.0983	5.3200e-003	0.0389	271.8273
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.1497**	**4.5200**	**1.6009**	**0.0182**	**0.7983**	**0.0310**	**0.8293**	**0.2170**	**0.0296**	**0.2466**		**1,960.3000**	**1,960.3000**	**0.0580**	**0.2796**	**2,045.0709**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Newell Creek Rd Section: Pavement Striping - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	180.4382					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2352	1.0270	1.4361	6.9600e-003		0.0348	0.0348		0.0348	0.0348		790.8209	790.8209	0.0209		791.3427
Total	**180.6734**	**1.0270**	**1.4361**	**6.9600e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**		**790.8209**	**790.8209**	**0.0209**		**791.3427**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.0805**	**0.0481**	**0.6561**	**2.1300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**215.7968**	**215.7968**	**4.3000e-003**	**5.4700e-003**	**217.5334**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Newell Creek Rd Section: Pavement Striping - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	180.4382					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2352	1.0270	1.4361	6.9600e-003		0.0348	0.0348		0.0348	0.0348	0.0000	790.8209	790.8209	0.0209		791.3427
Total	**180.6734**	**1.0270**	**1.4361**	**6.9600e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**	**0.0000**	**790.8209**	**790.8209**	**0.0209**		**791.3427**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.0805**	**0.0481**	**0.6561**	**2.1300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**215.7968**	**215.7968**	**4.3000e-003**	**5.4700e-003**	**217.5334**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Glen Arbor Rd Section: Staging and Mobilization - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433		961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**		**961.5139**	**961.5139**	**0.0353**		**962.3967**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.0805**	**0.0481**	**0.6561**	**2.1300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**215.7968**	**215.7968**	**4.3000e-003**	**5.4700e-003**	**217.5334**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Glen Arbor Rd Section: Staging and Mobilization - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433	0.0000	961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**961.5139**	**961.5139**	**0.0353**		**962.3967**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.0805**	**0.0481**	**0.6561**	**2.1300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**215.7968**	**215.7968**	**4.3000e-003**	**5.4700e-003**	**217.5334**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Glen Arbor Rd Section: Pipeline Grading - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0509	0.0000	0.0509	5.9300e-003	0.0000	5.9300e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809		1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0509**	**0.0809**	**0.1318**	**5.9300e-003**	**0.0809**	**0.0868**		**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0726	5.0051	1.0166	0.0180	0.5364	0.0345	0.5709	0.1467	0.0330	0.1797		1,959.8025	1,959.8025	0.0639	0.3106	2,053.9443
Vendor	0.0214	1.0213	0.2622	3.6300e-003	0.1282	5.4200e-003	0.1336	0.0369	5.1800e-003	0.0421		390.1474	390.1474	7.9800e-003	0.0584	407.7409
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.1745**	**6.0745**	**1.9349**	**0.0237**	**0.9712**	**0.0412**	**1.0123**	**0.2649**	**0.0394**	**0.3042**		**2,565.7468**	**2,565.7468**	**0.0762**	**0.3744**	**2,679.2186**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Glen Arbor Rd Section: Pipeline Grading - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0229	0.0000	0.0229	2.6700e-003	0.0000	2.6700e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809	0.0000	1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0229**	**0.0809**	**0.1038**	**2.6700e-003**	**0.0809**	**0.0836**	**0.0000**	**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0726	5.0051	1.0166	0.0180	0.5364	0.0345	0.5709	0.1467	0.0330	0.1797		1,959.8025	1,959.8025	0.0639	0.3106	2,053.9443
Vendor	0.0214	1.0213	0.2622	3.6300e-003	0.1282	5.4200e-003	0.1336	0.0369	5.1800e-003	0.0421		390.1474	390.1474	7.9800e-003	0.0584	407.7409
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.1745**	**6.0745**	**1.9349**	**0.0237**	**0.9712**	**0.0412**	**1.0123**	**0.2649**	**0.0394**	**0.3042**		**2,565.7468**	**2,565.7468**	**0.0762**	**0.3744**	**2,679.2186**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Glen Arbor Rd Section: Paving - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653		1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**		**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0776	5.3463	1.0859	0.0192	0.5730	0.0369	0.6099	0.1567	0.0353	0.1920		2,093.3915	2,093.3915	0.0683	0.3317	2,193.9504
Vendor	0.0204	0.9726	0.2497	3.4600e-003	0.1221	5.1600e-003	0.1273	0.0351	4.9400e-003	0.0401		371.5690	371.5690	7.6000e-003	0.0556	388.3246
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.1784**	**6.3670**	**1.9917**	**0.0248**	**1.0016**	**0.0433**	**1.0449**	**0.2731**	**0.0414**	**0.3145**		**2,680.7573**	**2,680.7573**	**0.0802**	**0.3928**	**2,799.8084**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Glen Arbor Rd Section: Paving - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653	0.0000	1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**	**0.0000**	**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0776	5.3463	1.0859	0.0192	0.5730	0.0369	0.6099	0.1567	0.0353	0.1920		2,093.3915	2,093.3915	0.0683	0.3317	2,193.9504
Vendor	0.0204	0.9726	0.2497	3.4600e-003	0.1221	5.1600e-003	0.1273	0.0351	4.9400e-003	0.0401		371.5690	371.5690	7.6000e-003	0.0556	388.3246
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.1784**	**6.3670**	**1.9917**	**0.0248**	**1.0016**	**0.0433**	**1.0449**	**0.2731**	**0.0414**	**0.3145**		**2,680.7573**	**2,680.7573**	**0.0802**	**0.3928**	**2,799.8084**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.9 Glen Arbor Rd Section: Pavement Striping - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	180.4382					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2352	1.0270	1.4361	6.9600e-003		0.0348	0.0348		0.0348	0.0348		790.8209	790.8209	0.0209		791.3427
Total	**180.6734**	**1.0270**	**1.4361**	**6.9600e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**		**790.8209**	**790.8209**	**0.0209**		**791.3427**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.0805**	**0.0481**	**0.6561**	**2.1300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**215.7968**	**215.7968**	**4.3000e-003**	**5.4700e-003**	**217.5334**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.9 Glen Arbor Rd Section: Pavement Striping - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	180.4382					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2352	1.0270	1.4361	6.9600e-003		0.0348	0.0348		0.0348	0.0348	0.0000	790.8209	790.8209	0.0209		791.3427
Total	**180.6734**	**1.0270**	**1.4361**	**6.9600e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**	**0.0000**	**790.8209**	**790.8209**	**0.0209**		**791.3427**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0805	0.0481	0.6561	2.1300e-003	0.3066	1.2400e-003	0.3078	0.0813	1.1400e-003	0.0824		215.7968	215.7968	4.3000e-003	5.4700e-003	217.5334
Total	**0.0805**	**0.0481**	**0.6561**	**2.1300e-003**	**0.3066**	**1.2400e-003**	**0.3078**	**0.0813**	**1.1400e-003**	**0.0824**		**215.7968**	**215.7968**	**4.3000e-003**	**5.4700e-003**	**217.5334**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.10 Brackney South Section: Staging and Mobilization - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433		961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**		**961.5139**	**961.5139**	**0.0353**		**962.3967**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.0754**	**0.0442**	**0.6265**	**2.0900e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**211.0420**	**211.0420**	**3.9700e-003**	**5.2400e-003**	**212.7025**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.10 Brackney South Section: Staging and Mobilization - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433	0.0000	961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**961.5139**	**961.5139**	**0.0353**		**962.3967**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.0754**	**0.0442**	**0.6265**	**2.0900e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**211.0420**	**211.0420**	**3.9700e-003**	**5.2400e-003**	**212.7025**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.11 Brackney South Section: Pipeline Grading - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0493	0.0000	0.0493	5.7400e-003	0.0000	5.7400e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809		1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0493**	**0.0809**	**0.1302**	**5.7400e-003**	**0.0809**	**0.0866**		**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0682	4.6757	0.9851	0.0170	0.5205	0.0324	0.5529	0.1423	0.0310	0.1733		1,859.2530	1,859.2530	0.0615	0.2946	1,948.5845
Vendor	9.8400e-003	0.4739	0.1239	1.7000e-003	0.0611	2.5000e-003	0.0635	0.0176	2.3900e-003	0.0200		182.3261	182.3261	3.7600e-003	0.0273	190.5415
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.1534**	**5.1938**	**1.7355**	**0.0208**	**0.8881**	**0.0361**	**0.9241**	**0.2412**	**0.0345**	**0.2756**		**2,252.6211**	**2,252.6211**	**0.0692**	**0.3271**	**2,351.8284**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.11 Brackney South Section: Pipeline Grading - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0222	0.0000	0.0222	2.5800e-003	0.0000	2.5800e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809	0.0000	1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0222**	**0.0809**	**0.1031**	**2.5800e-003**	**0.0809**	**0.0835**	**0.0000**	**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0682	4.6757	0.9851	0.0170	0.5205	0.0324	0.5529	0.1423	0.0310	0.1733		1,859.2530	1,859.2530	0.0615	0.2946	1,948.5845
Vendor	9.8400e-003	0.4739	0.1239	1.7000e-003	0.0611	2.5000e-003	0.0635	0.0176	2.3900e-003	0.0200		182.3261	182.3261	3.7600e-003	0.0273	190.5415
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.1534**	**5.1938**	**1.7355**	**0.0208**	**0.8881**	**0.0361**	**0.9241**	**0.2412**	**0.0345**	**0.2756**		**2,252.6211**	**2,252.6211**	**0.0692**	**0.3271**	**2,351.8284**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.12 San Lorenzo Way Section: Staging and Mobilization - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433		961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**		**961.5139**	**961.5139**	**0.0353**		**962.3967**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.0754**	**0.0442**	**0.6265**	**2.0900e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**211.0420**	**211.0420**	**3.9700e-003**	**5.2400e-003**	**212.7025**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.12 San Lorenzo Way Section: Staging and Mobilization - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433	0.0000	961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**961.5139**	**961.5139**	**0.0353**		**962.3967**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.0754**	**0.0442**	**0.6265**	**2.0900e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**211.0420**	**211.0420**	**3.9700e-003**	**5.2400e-003**	**212.7025**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.13 Brackney South Section: Paving - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653		1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	26.0166					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**26.7089**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**		**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1706	11.6989	2.4647	0.0426	1.3023	0.0811	1.3834	0.3561	0.0776	0.4337		4,652.0092	4,652.0092	0.1539	0.7371	4,875.5241
Vendor	8.8500e-003	0.4265	0.1115	1.5300e-003	0.0549	2.2500e-003	0.0572	0.0158	2.1500e-003	0.0180		164.0935	164.0935	3.3800e-003	0.0245	171.4874
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.2548**	**12.1696**	**3.2028**	**0.0463**	**1.6638**	**0.0845**	**1.7483**	**0.4532**	**0.0808**	**0.5340**		**5,027.1447**	**5,027.1447**	**0.1612**	**0.7669**	**5,259.7139**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.13 Brackney South Section: Paving - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653	0.0000	1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	26.0166					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**26.7089**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**	**0.0000**	**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1706	11.6989	2.4647	0.0426	1.3023	0.0811	1.3834	0.3561	0.0776	0.4337		4,652.0092	4,652.0092	0.1539	0.7371	4,875.5241
Vendor	8.8500e-003	0.4265	0.1115	1.5300e-003	0.0549	2.2500e-003	0.0572	0.0158	2.1500e-003	0.0180		164.0935	164.0935	3.3800e-003	0.0245	171.4874
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.2548**	**12.1696**	**3.2028**	**0.0463**	**1.6638**	**0.0845**	**1.7483**	**0.4532**	**0.0808**	**0.5340**		**5,027.1447**	**5,027.1447**	**0.1612**	**0.7669**	**5,259.7139**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.14 San Lorenzo Way Section: Pipeline Grading - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0573	0.0000	0.0573	6.6800e-003	0.0000	6.6800e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809		1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0573**	**0.0809**	**0.1382**	**6.6800e-003**	**0.0809**	**0.0876**		**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0791	5.4248	1.1429	0.0198	0.6039	0.0376	0.6415	0.1651	0.0360	0.2011		2,157.1539	2,157.1539	0.0714	0.3418	2,260.7986
Vendor	0.0128	0.6161	0.1611	2.2100e-003	0.0794	3.2500e-003	0.0826	0.0228	3.1100e-003	0.0259		237.0239	237.0239	4.8900e-003	0.0354	247.7040
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.1673**	**6.0851**	**1.9305**	**0.0241**	**0.9898**	**0.0420**	**1.0318**	**0.2693**	**0.0402**	**0.3094**		**2,605.2198**	**2,605.2198**	**0.0802**	**0.3825**	**2,721.2050**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.14 San Lorenzo Way Section: Pipeline Grading - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0258	0.0000	0.0258	3.0000e-003	0.0000	3.0000e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809	0.0000	1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0258**	**0.0809**	**0.1067**	**3.0000e-003**	**0.0809**	**0.0839**	**0.0000**	**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0791	5.4248	1.1429	0.0198	0.6039	0.0376	0.6415	0.1651	0.0360	0.2011		2,157.1539	2,157.1539	0.0714	0.3418	2,260.7986
Vendor	0.0128	0.6161	0.1611	2.2100e-003	0.0794	3.2500e-003	0.0826	0.0228	3.1100e-003	0.0259		237.0239	237.0239	4.8900e-003	0.0354	247.7040
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.1673**	**6.0851**	**1.9305**	**0.0241**	**0.9898**	**0.0420**	**1.0318**	**0.2693**	**0.0402**	**0.3094**		**2,605.2198**	**2,605.2198**	**0.0802**	**0.3825**	**2,721.2050**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.15 San Lorenzo Way Section: Paving - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653		1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**		**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0446	3.0573	0.6441	0.0111	0.3403	0.0212	0.3615	0.0931	0.0203	0.1133		1,215.7251	1,215.7251	0.0402	0.1926	1,274.1370
Vendor	0.0118	0.5687	0.1487	2.0400e-003	0.0733	3.0000e-003	0.0763	0.0211	2.8700e-003	0.0239		218.7913	218.7913	4.5100e-003	0.0327	228.6498
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.1318**	**3.6702**	**1.4193**	**0.0153**	**0.7201**	**0.0254**	**0.7455**	**0.1954**	**0.0242**	**0.2196**		**1,645.5584**	**1,645.5584**	**0.0487**	**0.2306**	**1,715.4892**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.15 San Lorenzo Way Section: Paving - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653	0.0000	1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**	**0.0000**	**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0446	3.0573	0.6441	0.0111	0.3403	0.0212	0.3615	0.0931	0.0203	0.1133		1,215.7251	1,215.7251	0.0402	0.1926	1,274.1370
Vendor	0.0118	0.5687	0.1487	2.0400e-003	0.0733	3.0000e-003	0.0763	0.0211	2.8700e-003	0.0239		218.7913	218.7913	4.5100e-003	0.0327	228.6498
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.1318**	**3.6702**	**1.4193**	**0.0153**	**0.7201**	**0.0254**	**0.7455**	**0.1954**	**0.0242**	**0.2196**		**1,645.5584**	**1,645.5584**	**0.0487**	**0.2306**	**1,715.4892**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.16 Felton Pump Station Section: Staging and Mobilization - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433		961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**		**961.5139**	**961.5139**	**0.0353**		**962.3967**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.0754**	**0.0442**	**0.6265**	**2.0900e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**211.0420**	**211.0420**	**3.9700e-003**	**5.2400e-003**	**212.7025**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.16 Felton Pump Station Section: Staging and Mobilization - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3977	1.5839	5.9053	0.0102		0.0433	0.0433		0.0433	0.0433	0.0000	961.5139	961.5139	0.0353		962.3967
Total	**0.3977**	**1.5839**	**5.9053**	**0.0102**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**0.0433**	**0.0433**	**0.0000**	**961.5139**	**961.5139**	**0.0353**		**962.3967**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.0754**	**0.0442**	**0.6265**	**2.0900e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**211.0420**	**211.0420**	**3.9700e-003**	**5.2400e-003**	**212.7025**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.17 Felton Pump Station Section: Grading - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0300	0.0000	0.0300	3.5000e-003	0.0000	3.5000e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809		1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0300**	**0.0809**	**0.1109**	**3.5000e-003**	**0.0809**	**0.0844**		**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0413	2.8350	0.5973	0.0103	0.3156	0.0197	0.3352	0.0863	0.0188	0.1051		1,127.3369	1,127.3369	0.0373	0.1786	1,181.5020
Vendor	5.9000e-003	0.2843	0.0744	1.0200e-003	0.0366	1.5000e-003	0.0381	0.0105	1.4300e-003	0.0120		109.3956	109.3956	2.2600e-003	0.0164	114.3249
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.1227**	**3.1636**	**1.2982**	**0.0134**	**0.6588**	**0.0223**	**0.6811**	**0.1781**	**0.0213**	**0.1994**		**1,447.7746**	**1,447.7746**	**0.0435**	**0.2002**	**1,508.5294**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.17 Felton Pump Station Section: Grading - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0135	0.0000	0.0135	1.5800e-003	0.0000	1.5800e-003			0.0000			0.0000
Off-Road	0.6282	3.3224	9.5345	0.0164		0.0809	0.0809		0.0809	0.0809	0.0000	1,554.1786	1,554.1786	0.0551		1,555.5567
Total	**0.6282**	**3.3224**	**9.5345**	**0.0164**	**0.0135**	**0.0809**	**0.0944**	**1.5800e-003**	**0.0809**	**0.0825**	**0.0000**	**1,554.1786**	**1,554.1786**	**0.0551**		**1,555.5567**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0413	2.8350	0.5973	0.0103	0.3156	0.0197	0.3352	0.0863	0.0188	0.1051		1,127.3369	1,127.3369	0.0373	0.1786	1,181.5020
Vendor	5.9000e-003	0.2843	0.0744	1.0200e-003	0.0366	1.5000e-003	0.0381	0.0105	1.4300e-003	0.0120		109.3956	109.3956	2.2600e-003	0.0164	114.3249
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.1227**	**3.1636**	**1.2982**	**0.0134**	**0.6588**	**0.0223**	**0.6811**	**0.1781**	**0.0213**	**0.1994**		**1,447.7746**	**1,447.7746**	**0.0435**	**0.2002**	**1,508.5294**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.18 Felton Pump Station Section: Paving - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653		1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**		**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0209	1.4351	0.3023	5.2300e-003	0.1597	9.9500e-003	0.1697	0.0437	9.5200e-003	0.0532		570.6465	570.6465	0.0189	0.0904	598.0643
Vendor	5.9000e-003	0.2843	0.0744	1.0200e-003	0.0366	1.5000e-003	0.0381	0.0105	1.4300e-003	0.0120		109.3956	109.3956	2.2600e-003	0.0164	114.3249
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.1022**	**1.7636**	**1.0032**	**8.3400e-003**	**0.5029**	**0.0126**	**0.5155**	**0.1355**	**0.0120**	**0.1475**		**891.0841**	**891.0841**	**0.0251**	**0.1120**	**925.0917**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.18 Felton Pump Station Section: Paving - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6923	3.5601	7.9248	0.0140		0.1653	0.1653		0.1653	0.1653	0.0000	1,328.2584	1,328.2584	0.0623		1,329.8151
Paving	5.2033					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**5.8956**	**3.5601**	**7.9248**	**0.0140**		**0.1653**	**0.1653**		**0.1653**	**0.1653**	**0.0000**	**1,328.2584**	**1,328.2584**	**0.0623**		**1,329.8151**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0209	1.4351	0.3023	5.2300e-003	0.1597	9.9500e-003	0.1697	0.0437	9.5200e-003	0.0532		570.6465	570.6465	0.0189	0.0904	598.0643
Vendor	5.9000e-003	0.2843	0.0744	1.0200e-003	0.0366	1.5000e-003	0.0381	0.0105	1.4300e-003	0.0120		109.3956	109.3956	2.2600e-003	0.0164	114.3249
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.1022**	**1.7636**	**1.0032**	**8.3400e-003**	**0.5029**	**0.0126**	**0.5155**	**0.1355**	**0.0120**	**0.1475**		**891.0841**	**891.0841**	**0.0251**	**0.1120**	**925.0917**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.19 Felton Pump Station Section: Pavement Striping - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	90.2191					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2352	1.0270	1.4361	6.9600e-003		0.0348	0.0348		0.0348	0.0348		790.8209	790.8209	0.0209		791.3427
Total	**90.4543**	**1.0270**	**1.4361**	**6.9600e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**		**790.8209**	**790.8209**	**0.0209**		**791.3427**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.0754**	**0.0442**	**0.6265**	**2.0900e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**211.0420**	**211.0420**	**3.9700e-003**	**5.2400e-003**	**212.7025**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.19 Felton Pump Station Section: Pavement Striping - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	90.2191					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2352	1.0270	1.4361	6.9600e-003		0.0348	0.0348		0.0348	0.0348	0.0000	790.8209	790.8209	0.0209		791.3427
Total	**90.4543**	**1.0270**	**1.4361**	**6.9600e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**	**0.0000**	**790.8209**	**790.8209**	**0.0209**		**791.3427**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0754	0.0442	0.6265	2.0900e-003	0.3066	1.1600e-003	0.3077	0.0813	1.0700e-003	0.0824		211.0420	211.0420	3.9700e-003	5.2400e-003	212.7025
Total	**0.0754**	**0.0442**	**0.6265**	**2.0900e-003**	**0.3066**	**1.1600e-003**	**0.3077**	**0.0813**	**1.0700e-003**	**0.0824**		**211.0420**	**211.0420**	**3.9700e-003**	**5.2400e-003**	**212.7025**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.552058	0.056962	0.193821	0.123008	0.021404	0.005318	0.010231	0.003525	0.000574	0.000778	0.028458	0.000952	0.002912

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1533	1.0000e-005	1.0100e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.1700e-003	2.1700e-003	1.0000e-005		2.3100e-003
Unmitigated	0.1533	1.0000e-005	1.0100e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.1700e-003	2.1700e-003	1.0000e-005		2.3100e-003

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1532					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.0000e-005	1.0000e-005	1.0100e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.1700e-003	2.1700e-003	1.0000e-005		2.3100e-003
Total	**0.1533**	**1.0000e-005**	**1.0100e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.1700e-003**	**2.1700e-003**	**1.0000e-005**		**2.3100e-003**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1532					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	9.0000e-005	1.0000e-005	1.0100e-003	0.0000		0.0000	0.0000		0.0000	0.0000		2.1700e-003	2.1700e-003	1.0000e-005		2.3100e-003
Total	**0.1533**	**1.0000e-005**	**1.0100e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.1700e-003**	**2.1700e-003**	**1.0000e-005**		**2.3100e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Newell Creek Pipeline Construction - Long Term

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	9.93	Acre	9.93	432,550.80	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	1.8	**Precipitation Freq (Days)**	61
Climate Zone	5			**Operational Year**	2032
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Area to be paved conservatively based on total length (linear feet) of pipelines by 20 feet width (long term construction)

Construction Phase - Schedule based on SCWD input

Off-road Equipment - Based on input from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Off-road Equipment - Based on info from SCWD

Trips and VMT - Based on input from SCWD

On-road Fugitive Dust - Default

Grading - Based on input from SCWD

Architectural Coating - Default

Vehicle Trips - Modeling construction only

Area Coating - Modeling construction only

Construction Off-road Equipment Mitigation - Water exposed areas 2x per day

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstructionPhase	NumDays	20.00	2.00
tblConstructionPhase	NumDays	20.00	1.00
tblConstructionPhase	NumDays	20.00	1.00
tblConstructionPhase	NumDays	20.00	40.00
tblConstructionPhase	NumDays	20.00	45.00
tblConstructionPhase	NumDays	20.00	40.00
tblConstructionPhase	NumDays	20.00	55.00
tblConstructionPhase	NumDays	20.00	85.00
tblConstructionPhase	NumDays	20.00	1.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	20.00	5.00
tblConstructionPhase	NumDays	10.00	5.00
tblConstructionPhase	NumDays	10.00	5.00
tblConstructionPhase	NumDays	10.00	1.00
tblConstructionPhase	NumDays	10.00	3.00
tblGrading	AcresOfGrading	0.00	1.49
tblGrading	AcresOfGrading	0.00	1.95
tblGrading	AcresOfGrading	0.00	0.91
tblGrading	AcresOfGrading	0.00	2.31
tblGrading	AcresOfGrading	0.00	3.27
tblGrading	MaterialExported	0.00	4,483.00
tblGrading	MaterialExported	0.00	5,851.00
tblGrading	MaterialExported	0.00	2,717.00
tblGrading	MaterialExported	0.00	6,945.00
tblGrading	MaterialExported	0.00	9,820.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	560.00	1,199.00
tblTripsAndVMT	HaulingTripNumber	0.00	75.00
tblTripsAndVMT	HaulingTripNumber	731.00	1,565.00
tblTripsAndVMT	HaulingTripNumber	0.00	98.00
tblTripsAndVMT	HaulingTripNumber	340.00	727.00
tblTripsAndVMT	HaulingTripNumber	0.00	46.00
tblTripsAndVMT	HaulingTripNumber	868.00	1,857.00
tblTripsAndVMT	HaulingTripNumber	0.00	117.00
tblTripsAndVMT	HaulingTripNumber	1,228.00	2,626.00
tblTripsAndVMT	HaulingTripNumber	0.00	165.00
tblTripsAndVMT	VendorTripNumber	0.00	10.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	12.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	15.00
tblTripsAndVMT	VendorTripNumber	0.00	14.00
tblTripsAndVMT	VendorTripNumber	0.00	21.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripNumber	5.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	5.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	5.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	36.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	36.00	24.00
tblTripsAndVMT	WorkerTripNumber	5.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	24.00
tblTripsAndVMT	WorkerTripNumber	36.00	24.00
tblTripsAndVMT	WorkerTripNumber	5.00	24.00

2.0 Emissions Summary

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2030	0.2687	0.7089	0.8775	3.0600e-003	0.0756	9.8100e-003	0.0854	0.0201	9.6700e-003	0.0298	0.0000	285.0662	285.0662	9.1900e-003	0.0256	292.9227
2031	0.1859	0.5605	0.8032	2.5200e-003	0.0607	8.6000e-003	0.0693	0.0161	8.5000e-003	0.0246	0.0000	232.4749	232.4749	7.6600e-003	0.0185	238.1833
Maximum	**0.2687**	**0.7089**	**0.8775**	**3.0600e-003**	**0.0756**	**9.8100e-003**	**0.0854**	**0.0201**	**9.6700e-003**	**0.0298**	**0.0000**	**285.0662**	**285.0662**	**9.1900e-003**	**0.0256**	**292.9227**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2030	0.2687	0.7089	0.8775	3.0600e-003	0.0736	9.8100e-003	0.0834	0.0199	9.6700e-003	0.0295	0.0000	285.0661	285.0661	9.1900e-003	0.0256	292.9226
2031	0.1859	0.5605	0.8032	2.5200e-003	0.0592	8.6000e-003	0.0678	0.0159	8.5000e-003	0.0244	0.0000	232.4747	232.4747	7.6600e-003	0.0185	238.1831
Maximum	**0.2687**	**0.7089**	**0.8775**	**3.0600e-003**	**0.0736**	**9.8100e-003**	**0.0834**	**0.0199**	**9.6700e-003**	**0.0295**	**0.0000**	**285.0661**	**285.0661**	**9.1900e-003**	**0.0256**	**292.9226**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**2.65**	**0.00**	**2.33**	**1.13**	**0.00**	**0.79**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**3-4-2030**	**6-3-2030**	0.3107	0.3107
2	**6-4-2030**	**9-3-2030**	0.3717	0.3717
3	**9-4-2030**	**12-3-2030**	0.2037	0.2037
4	**12-4-2030**	**3-3-2031**	0.0008	0.0008
5	**3-4-2031**	**6-3-2031**	0.2596	0.2596
6	**6-4-2031**	**9-3-2031**	0.2796	0.2796
7	**9-4-2031**	**9-30-2031**	0.1259	0.1259
		Highest	0.3717	0.3717

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0280	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0280**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.6000e-004**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0280	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0280**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.6000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**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**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Newell Creek Rd Section: Staging and Mobilization	Site Preparation	3/4/2030	3/8/2030	5	5	
2	Newell Creek Rd Section: Pipeline Grading/ Install	Grading	3/11/2030	5/24/2030	5	55	
3	Newell Creek Rd Section: Paving	Paving	5/28/2030	6/3/2030	5	5	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4	Newell Creek Rd Section: Pavement Striping	Architectural Coating	6/4/2030	6/4/2030	5	1	
5	Glen Arbor Rd Section: Staging and Mobilization	Site Preparation	6/5/2030	6/7/2030	5	3	
6	Glen Arbor Rd Section: Pipeline Grading	Grading	6/10/2030	10/4/2030	5	85	
7	Glen Arbor Rd Section: Paving	Paving	10/7/2030	10/11/2030	5	5	
8	Glen Arbor Rd Section: Pavement Striping	Architectural Coating	10/14/2030	10/14/2030	5	1	
9	Brackney South Section: Staging and Mobilization	Site Preparation	3/3/2031	3/14/2031	5	10	
10	Brackney South Section: Pipeline Grading	Grading	3/17/2031	5/9/2031	5	40	
11	San Lorenzo Way Section: Staging and Mobilization	Site Preparation	5/12/2031	5/16/2031	5	5	
12	Brackney South Section: Paving	Paving	5/12/2031	5/12/2031	5	1	
13	San Lorenzo Way Section: Pipeline Grading	Grading	5/19/2031	7/18/2031	5	45	
14	San Lorenzo Way Section: Paving	Paving	7/21/2031	7/25/2031	5	5	
15	Felton Pump Station Section: Staging and Mobilization	Site Preparation	7/28/2031	7/28/2031	5	1	
16	Felton Pump Station Section: Grading	Grading	7/28/2031	9/19/2031	5	40	
17	Felton Pump Station Section: Paving	Paving	9/22/2031	9/26/2031	5	5	
18	Felton Pump Station Section: Pavement Striping	Architectural Coating	9/29/2031	9/30/2031	5	2	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 2.31

Acres of Paving: 9.93

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 25,953 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Newell Creek Rd Section: Staging and Mobilization	Excavators	1	8.00	158	0.38
Newell Creek Rd Section: Staging and Mobilization	Rubber Tired Dozers	0	8.00	247	0.40

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Newell Creek Rd Section: Staging and Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Newell Creek Rd Section: Pipeline Grading/ Install	Concrete/Industrial Saws	1	8.00	81	0.73
Newell Creek Rd Section: Pipeline Grading/ Install	Excavators	1	8.00	158	0.38
Newell Creek Rd Section: Pipeline Grading/ Install	Graders	0	8.00	187	0.41
Newell Creek Rd Section: Pipeline Grading/ Install	Rubber Tired Dozers	0	8.00	247	0.40
Newell Creek Rd Section: Pipeline Grading/ Install	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Newell Creek Rd Section: Paving	Pavers	1	8.00	130	0.42
Newell Creek Rd Section: Paving	Paving Equipment	1	8.00	132	0.36
Newell Creek Rd Section: Paving	Rollers	1	8.00	80	0.38
Newell Creek Rd Section: Pavement Striping	Air Compressors	0	6.00	78	0.48
Newell Creek Rd Section: Pavement Striping	Surfacing Equipment	1	8.00	263	0.30
Glen Arbor Rd Section: Staging and Mobilization	Excavators	1	8.00	158	0.38
Glen Arbor Rd Section: Staging and Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Glen Arbor Rd Section: Staging and Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Glen Arbor Rd Section: Pipeline Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Glen Arbor Rd Section: Pipeline Grading	Excavators	1	8.00	158	0.38
Glen Arbor Rd Section: Pipeline Grading	Graders	0	8.00	187	0.41
Glen Arbor Rd Section: Pipeline Grading	Rubber Tired Dozers	0	8.00	247	0.40
Glen Arbor Rd Section: Pipeline Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Glen Arbor Rd Section: Paving	Pavers	1	8.00	130	0.42
Glen Arbor Rd Section: Paving	Paving Equipment	1	8.00	132	0.36
Glen Arbor Rd Section: Paving	Rollers	1	8.00	80	0.38
Glen Arbor Rd Section: Pavement Striping	Air Compressors	0	6.00	78	0.48
Glen Arbor Rd Section: Pavement Striping	Surfacing Equipment	1	8.00	263	0.30
Brackney South Section: Staging and Mobilization	Excavators	1	8.00	158	0.38

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Brackney South Section: Staging and Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Brackney South Section: Staging and Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Brackney South Section: Pipeline Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Brackney South Section: Pipeline Grading	Excavators	1	8.00	158	0.38
Brackney South Section: Pipeline Grading	Graders	0	8.00	187	0.41
Brackney South Section: Pipeline Grading	Rubber Tired Dozers	0	8.00	247	0.40
Brackney South Section: Pipeline Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Brackney South Section: Paving	Pavers	1	8.00	130	0.42
Brackney South Section: Paving	Paving Equipment	1	8.00	132	0.36
Brackney South Section: Paving	Rollers	1	8.00	80	0.38
San Lorenzo Way Section: Staging and Mobilization	Excavators	1	8.00	158	0.38
San Lorenzo Way Section: Staging and Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
San Lorenzo Way Section: Staging and Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
San Lorenzo Way Section: Pipeline Grading	Concrete/Industrial Saws	1	8.00	81	0.73
San Lorenzo Way Section: Pipeline Grading	Excavators	1	8.00	158	0.38
San Lorenzo Way Section: Pipeline Grading	Graders	0	8.00	187	0.41
San Lorenzo Way Section: Pipeline Grading	Rubber Tired Dozers	0	8.00	247	0.40
San Lorenzo Way Section: Pipeline Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
San Lorenzo Way Section: Paving	Pavers	1	8.00	130	0.42
San Lorenzo Way Section: Paving	Paving Equipment	1	8.00	132	0.36
San Lorenzo Way Section: Paving	Rollers	1	8.00	80	0.38
Felton Pump Station Section: Staging and Mobilization	Excavators	1	8.00	158	0.38
Felton Pump Station Section: Staging and Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Felton Pump Station Section: Staging and Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Felton Pump Station Section: Grading	Concrete/Industrial Saws	1	8.00	81	0.73

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Felton Pump Station Section: Grading	Excavators	1	8.00	158	0.38
Felton Pump Station Section: Grading	Graders	0	8.00	187	0.41
Felton Pump Station Section: Grading	Rubber Tired Dozers	0	8.00	247	0.40
Felton Pump Station Section: Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Felton Pump Station Section: Paving	Pavers	1	8.00	130	0.42
Felton Pump Station Section: Paving	Paving Equipment	1	8.00	132	0.36
Felton Pump Station Section: Paving	Rollers	1	8.00	80	0.38
Felton Pump Station Section: Pavement Striping	Air Compressors	0	6.00	78	0.48
Felton Pump Station Section: Pavement Striping	Surfacing Equipment	1	8.00	263	0.30

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Newell Creek Rd Section: Staging and	2	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Newell Creek Rd Section: Pipeline Grad	3	24.00	15.00	1,857.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Newell Creek Rd Section: Paving	3	24.00	14.00	117.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Newell Creek Rd Section: Pavement Str	1	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Glen Arbor Rd Section: Staging and	2	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Glen Arbor Rd Section: Pipeline Grad	3	24.00	21.00	2,626.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Glen Arbor Rd Section: Paving	3	24.00	20.00	165.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Glen Arbor Rd Section: Pavement Str	1	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney South Section: Staging and	2	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney South Section: Pipeline Grad	3	24.00	10.00	1,199.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Brackney South Section: Paving	3	24.00	9.00	75.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
San Lorenzo Way Section: Staging and	2	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
San Lorenzo Way Section: Pipeline Grad	3	24.00	13.00	1,565.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
San Lorenzo Way Section: Paving	3	24.00	12.00	98.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Felton Pump Station Section: Staging and	2	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Felton Pump Station Section: Grading	3	24.00	6.00	727.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Felton Pump Station Section: Paving	3	24.00	6.00	46.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Felton Pump Station Section: Pavement Str	1	24.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Newell Creek Rd Section: Staging and Mobilization - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.9000e-004	3.9600e-003	0.0148	3.0000e-005		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004	0.0000	2.1807	2.1807	8.0000e-005	0.0000	2.1827
Total	**9.9000e-004**	**3.9600e-003**	**0.0148**	**3.0000e-005**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**2.1807**	**2.1807**	**8.0000e-005**	**0.0000**	**2.1827**

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3.2 Newell Creek Rd Section: Staging and Mobilization - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.1000e-004	1.5800e-003	1.0000e-005	7.4000e-004	0.0000	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.4897	0.4897	1.0000e-005	1.0000e-005	0.4934
Total	**1.8000e-004**	**1.1000e-004**	**1.5800e-003**	**1.0000e-005**	**7.4000e-004**	**0.0000**	**7.4000e-004**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.4897**	**0.4897**	**1.0000e-005**	**1.0000e-005**	**0.4934**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.9000e-004	3.9600e-003	0.0148	3.0000e-005		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004	0.0000	2.1807	2.1807	8.0000e-005	0.0000	2.1827
Total	**9.9000e-004**	**3.9600e-003**	**0.0148**	**3.0000e-005**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**2.1807**	**2.1807**	**8.0000e-005**	**0.0000**	**2.1827**

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3.2 Newell Creek Rd Section: Staging and Mobilization - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.1000e-004	1.5800e-003	1.0000e-005	7.4000e-004	0.0000	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.4897	0.4897	1.0000e-005	1.0000e-005	0.4934
Total	**1.8000e-004**	**1.1000e-004**	**1.5800e-003**	**1.0000e-005**	**7.4000e-004**	**0.0000**	**7.4000e-004**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.4897**	**0.4897**	**1.0000e-005**	**1.0000e-005**	**0.4934**

3.3 Newell Creek Rd Section: Pipeline Grading/ Install - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.5300e-003	0.0000	1.5300e-003	1.8000e-004	0.0000	1.8000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0173	0.0914	0.2622	4.5000e-004		2.2200e-003	2.2200e-003		2.2200e-003	2.2200e-003	0.0000	38.7730	38.7730	1.3800e-003	0.0000	38.8074
Total	**0.0173**	**0.0914**	**0.2622**	**4.5000e-004**	**1.5300e-003**	**2.2200e-003**	**3.7500e-003**	**1.8000e-004**	**2.2200e-003**	**2.4000e-003**	**0.0000**	**38.7730**	**38.7730**	**1.3800e-003**	**0.0000**	**38.8074**

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3.3 Newell Creek Rd Section: Pipeline Grading/ Install - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.2500e-003	0.1485	0.0303	5.4000e-004	0.0156	1.0400e-003	0.0166	4.2800e-003	9.9000e-004	5.2700e-003	0.0000	53.4138	53.4138	1.7500e-003	8.4600e-003	55.9797
Vendor	4.3000e-004	0.0198	5.0500e-003	7.0000e-005	2.4400e-003	1.1000e-004	2.5500e-003	7.1000e-004	1.0000e-004	8.1000e-004	0.0000	6.9477	6.9477	1.4000e-004	1.0400e-003	7.2610
Worker	1.9800e-003	1.2100e-003	0.0174	6.0000e-005	8.1200e-003	3.0000e-005	8.1600e-003	2.1600e-003	3.0000e-005	2.1900e-003	0.0000	5.3866	5.3866	1.0000e-004	1.3000e-004	5.4275
Total	**4.6600e-003**	**0.1695**	**0.0528**	**6.7000e-004**	**0.0262**	**1.1800e-003**	**0.0274**	**7.1500e-003**	**1.1200e-003**	**8.2700e-003**	**0.0000**	**65.7482**	**65.7482**	**1.9900e-003**	**9.6300e-003**	**68.6681**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.9000e-004	0.0000	6.9000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0173	0.0914	0.2622	4.5000e-004		2.2200e-003	2.2200e-003		2.2200e-003	2.2200e-003	0.0000	38.7730	38.7730	1.3800e-003	0.0000	38.8073
Total	**0.0173**	**0.0914**	**0.2622**	**4.5000e-004**	**6.9000e-004**	**2.2200e-003**	**2.9100e-003**	**8.0000e-005**	**2.2200e-003**	**2.3000e-003**	**0.0000**	**38.7730**	**38.7730**	**1.3800e-003**	**0.0000**	**38.8073**

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3.3 Newell Creek Rd Section: Pipeline Grading/ Install - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.2500e-003	0.1485	0.0303	5.4000e-004	0.0156	1.0400e-003	0.0166	4.2800e-003	9.9000e-004	5.2700e-003	0.0000	53.4138	53.4138	1.7500e-003	8.4600e-003	55.9797
Vendor	4.3000e-004	0.0198	5.0500e-003	7.0000e-005	2.4400e-003	1.1000e-004	2.5500e-003	7.1000e-004	1.0000e-004	8.1000e-004	0.0000	6.9477	6.9477	1.4000e-004	1.0400e-003	7.2610
Worker	1.9800e-003	1.2100e-003	0.0174	6.0000e-005	8.1200e-003	3.0000e-005	8.1600e-003	2.1600e-003	3.0000e-005	2.1900e-003	0.0000	5.3866	5.3866	1.0000e-004	1.3000e-004	5.4275
Total	**4.6600e-003**	**0.1695**	**0.0528**	**6.7000e-004**	**0.0262**	**1.1800e-003**	**0.0274**	**7.1500e-003**	**1.1200e-003**	**8.2700e-003**	**0.0000**	**65.7482**	**65.7482**	**1.9900e-003**	**9.6300e-003**	**68.6681**

3.4 Newell Creek Rd Section: Paving - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.7300e-003	8.9000e-003	0.0198	4.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	3.0124	3.0124	1.4000e-004	0.0000	3.0160
Paving	0.0130					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0147**	**8.9000e-003**	**0.0198**	**4.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**3.0124**	**3.0124**	**1.4000e-004**	**0.0000**	**3.0160**

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3.4 Newell Creek Rd Section: Paving - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4000e-004	9.3600e-003	1.9100e-003	3.0000e-005	9.8000e-004	7.0000e-005	1.0500e-003	2.7000e-004	6.0000e-005	3.3000e-004	0.0000	3.3653	3.3653	1.1000e-004	5.3000e-004	3.5270
Vendor	4.0000e-005	1.6800e-003	4.3000e-004	1.0000e-005	2.1000e-004	1.0000e-005	2.2000e-004	6.0000e-005	1.0000e-005	7.0000e-005	0.0000	0.5895	0.5895	1.0000e-005	9.0000e-005	0.6161
Worker	1.8000e-004	1.1000e-004	1.5800e-003	1.0000e-005	7.4000e-004	0.0000	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.4897	0.4897	1.0000e-005	1.0000e-005	0.4934
Total	**3.6000e-004**	**0.0112**	**3.9200e-003**	**5.0000e-005**	**1.9300e-003**	**8.0000e-005**	**2.0100e-003**	**5.3000e-004**	**7.0000e-005**	**6.0000e-004**	**0.0000**	**4.4445**	**4.4445**	**1.3000e-004**	**6.3000e-004**	**4.6365**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.7300e-003	8.9000e-003	0.0198	4.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	3.0124	3.0124	1.4000e-004	0.0000	3.0160
Paving	0.0130					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0147**	**8.9000e-003**	**0.0198**	**4.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**3.0124**	**3.0124**	**1.4000e-004**	**0.0000**	**3.0160**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Newell Creek Rd Section: Paving - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4000e-004	9.3600e-003	1.9100e-003	3.0000e-005	9.8000e-004	7.0000e-005	1.0500e-003	2.7000e-004	6.0000e-005	3.3000e-004	0.0000	3.3653	3.3653	1.1000e-004	5.3000e-004	3.5270
Vendor	4.0000e-005	1.6800e-003	4.3000e-004	1.0000e-005	2.1000e-004	1.0000e-005	2.2000e-004	6.0000e-005	1.0000e-005	7.0000e-005	0.0000	0.5895	0.5895	1.0000e-005	9.0000e-005	0.6161
Worker	1.8000e-004	1.1000e-004	1.5800e-003	1.0000e-005	7.4000e-004	0.0000	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.4897	0.4897	1.0000e-005	1.0000e-005	0.4934
Total	**3.6000e-004**	**0.0112**	**3.9200e-003**	**5.0000e-005**	**1.9300e-003**	**8.0000e-005**	**2.0100e-003**	**5.3000e-004**	**7.0000e-005**	**6.0000e-004**	**0.0000**	**4.4445**	**4.4445**	**1.3000e-004**	**6.3000e-004**	**4.6365**

3.5 Newell Creek Rd Section: Pavement Striping - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0902					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2000e-004	5.1000e-004	7.2000e-004	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.3587	0.3587	1.0000e-005	0.0000	0.3590
Total	**0.0903**	**5.1000e-004**	**7.2000e-004**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.3587**	**0.3587**	**1.0000e-005**	**0.0000**	**0.3590**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Newell Creek Rd Section: Pavement Striping - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	2.0000e-005	3.2000e-004	0.0000	1.5000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0979	0.0979	0.0000	0.0000	0.0987
Total	**4.0000e-005**	**2.0000e-005**	**3.2000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.0979**	**0.0979**	**0.0000**	**0.0000**	**0.0987**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0902					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2000e-004	5.1000e-004	7.2000e-004	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.3587	0.3587	1.0000e-005	0.0000	0.3590
Total	**0.0903**	**5.1000e-004**	**7.2000e-004**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.3587**	**0.3587**	**1.0000e-005**	**0.0000**	**0.3590**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Newell Creek Rd Section: Pavement Striping - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	2.0000e-005	3.2000e-004	0.0000	1.5000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0979	0.0979	0.0000	0.0000	0.0987
Total	**4.0000e-005**	**2.0000e-005**	**3.2000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.0979**	**0.0979**	**0.0000**	**0.0000**	**0.0987**

3.6 Glen Arbor Rd Section: Staging and Mobilization - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.0000e-004	2.3800e-003	8.8600e-003	2.0000e-005		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005	0.0000	1.3084	1.3084	5.0000e-005	0.0000	1.3096
Total	**6.0000e-004**	**2.3800e-003**	**8.8600e-003**	**2.0000e-005**	**0.0000**	**7.0000e-005**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**7.0000e-005**	**0.0000**	**1.3084**	**1.3084**	**5.0000e-005**	**0.0000**	**1.3096**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Glen Arbor Rd Section: Staging and Mobilization - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	7.0000e-005	9.5000e-004	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.2938	0.2938	1.0000e-005	1.0000e-005	0.2960
Total	**1.1000e-004**	**7.0000e-005**	**9.5000e-004**	**0.0000**	**4.4000e-004**	**0.0000**	**4.4000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.2938**	**0.2938**	**1.0000e-005**	**1.0000e-005**	**0.2960**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.0000e-004	2.3800e-003	8.8600e-003	2.0000e-005		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005	0.0000	1.3084	1.3084	5.0000e-005	0.0000	1.3096
Total	**6.0000e-004**	**2.3800e-003**	**8.8600e-003**	**2.0000e-005**	**0.0000**	**7.0000e-005**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**7.0000e-005**	**0.0000**	**1.3084**	**1.3084**	**5.0000e-005**	**0.0000**	**1.3096**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Glen Arbor Rd Section: Staging and Mobilization - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	7.0000e-005	9.5000e-004	0.0000	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.2938	0.2938	1.0000e-005	1.0000e-005	0.2960
Total	**1.1000e-004**	**7.0000e-005**	**9.5000e-004**	**0.0000**	**4.4000e-004**	**0.0000**	**4.4000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.2938**	**0.2938**	**1.0000e-005**	**1.0000e-005**	**0.2960**

3.7 Glen Arbor Rd Section: Pipeline Grading - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.1600e-003	0.0000	2.1600e-003	2.5000e-004	0.0000	2.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0267	0.1412	0.4052	7.0000e-004		3.4400e-003	3.4400e-003		3.4400e-003	3.4400e-003	0.0000	59.9219	59.9219	2.1300e-003	0.0000	59.9750
Total	**0.0267**	**0.1412**	**0.4052**	**7.0000e-004**	**2.1600e-003**	**3.4400e-003**	**5.6000e-003**	**2.5000e-004**	**3.4400e-003**	**3.6900e-003**	**0.0000**	**59.9219**	**59.9219**	**2.1300e-003**	**0.0000**	**59.9750**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Glen Arbor Rd Section: Pipeline Grading - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.1800e-003	0.2100	0.0429	7.6000e-004	0.0221	1.4700e-003	0.0235	6.0600e-003	1.4000e-003	7.4600e-003	0.0000	75.5330	75.5330	2.4700e-003	0.0120	79.1613
Vendor	9.2000e-004	0.0428	0.0109	1.5000e-004	5.2900e-003	2.3000e-004	5.5200e-003	1.5300e-003	2.2000e-004	1.7500e-003	0.0000	15.0324	15.0324	3.1000e-004	2.2500e-003	15.7101
Worker	3.0600e-003	1.8800e-003	0.0269	9.0000e-005	0.0126	5.0000e-005	0.0126	3.3400e-003	5.0000e-005	3.3900e-003	0.0000	8.3247	8.3247	1.6000e-004	2.0000e-004	8.3879
Total	**7.1600e-003**	**0.2546**	**0.0807**	**1.0000e-003**	**0.0399**	**1.7500e-003**	**0.0417**	**0.0109**	**1.6700e-003**	**0.0126**	**0.0000**	**98.8901**	**98.8901**	**2.9400e-003**	**0.0144**	**103.2593**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.7000e-004	0.0000	9.7000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0267	0.1412	0.4052	7.0000e-004		3.4400e-003	3.4400e-003		3.4400e-003	3.4400e-003	0.0000	59.9218	59.9218	2.1300e-003	0.0000	59.9750
Total	**0.0267**	**0.1412**	**0.4052**	**7.0000e-004**	**9.7000e-004**	**3.4400e-003**	**4.4100e-003**	**1.1000e-004**	**3.4400e-003**	**3.5500e-003**	**0.0000**	**59.9218**	**59.9218**	**2.1300e-003**	**0.0000**	**59.9750**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Glen Arbor Rd Section: Pipeline Grading - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.1800e-003	0.2100	0.0429	7.6000e-004	0.0221	1.4700e-003	0.0235	6.0600e-003	1.4000e-003	7.4600e-003	0.0000	75.5330	75.5330	2.4700e-003	0.0120	79.1613
Vendor	9.2000e-004	0.0428	0.0109	1.5000e-004	5.2900e-003	2.3000e-004	5.5200e-003	1.5300e-003	2.2000e-004	1.7500e-003	0.0000	15.0324	15.0324	3.1000e-004	2.2500e-003	15.7101
Worker	3.0600e-003	1.8800e-003	0.0269	9.0000e-005	0.0126	5.0000e-005	0.0126	3.3400e-003	5.0000e-005	3.3900e-003	0.0000	8.3247	8.3247	1.6000e-004	2.0000e-004	8.3879
Total	**7.1600e-003**	**0.2546**	**0.0807**	**1.0000e-003**	**0.0399**	**1.7500e-003**	**0.0417**	**0.0109**	**1.6700e-003**	**0.0126**	**0.0000**	**98.8901**	**98.8901**	**2.9400e-003**	**0.0144**	**103.2593**

3.8 Glen Arbor Rd Section: Paving - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.7300e-003	8.9000e-003	0.0198	4.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	3.0124	3.0124	1.4000e-004	0.0000	3.0160
Paving	0.0130					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0147**	**8.9000e-003**	**0.0198**	**4.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**3.0124**	**3.0124**	**1.4000e-004**	**0.0000**	**3.0160**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Glen Arbor Rd Section: Paving - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-004	0.0132	2.6900e-003	5.0000e-005	1.3900e-003	9.0000e-005	1.4800e-003	3.8000e-004	9.0000e-005	4.7000e-004	0.0000	4.7460	4.7460	1.6000e-004	7.5000e-004	4.9740
Vendor	5.0000e-005	2.4000e-003	6.1000e-004	1.0000e-005	3.0000e-004	1.0000e-005	3.1000e-004	9.0000e-005	1.0000e-005	1.0000e-004	0.0000	0.8422	0.8422	2.0000e-005	1.3000e-004	0.8801
Worker	1.8000e-004	1.1000e-004	1.5800e-003	1.0000e-005	7.4000e-004	0.0000	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.4897	0.4897	1.0000e-005	1.0000e-005	0.4934
Total	**4.3000e-004**	**0.0157**	**4.8800e-003**	**7.0000e-005**	**2.4300e-003**	**1.0000e-004**	**2.5300e-003**	**6.7000e-004**	**1.0000e-004**	**7.7000e-004**	**0.0000**	**6.0778**	**6.0778**	**1.9000e-004**	**8.9000e-004**	**6.3475**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.7300e-003	8.9000e-003	0.0198	4.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	3.0124	3.0124	1.4000e-004	0.0000	3.0160
Paving	0.0130					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0147**	**8.9000e-003**	**0.0198**	**4.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**3.0124**	**3.0124**	**1.4000e-004**	**0.0000**	**3.0160**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 Glen Arbor Rd Section: Paving - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-004	0.0132	2.6900e-003	5.0000e-005	1.3900e-003	9.0000e-005	1.4800e-003	3.8000e-004	9.0000e-005	4.7000e-004	0.0000	4.7460	4.7460	1.6000e-004	7.5000e-004	4.9740
Vendor	5.0000e-005	2.4000e-003	6.1000e-004	1.0000e-005	3.0000e-004	1.0000e-005	3.1000e-004	9.0000e-005	1.0000e-005	1.0000e-004	0.0000	0.8422	0.8422	2.0000e-005	1.3000e-004	0.8801
Worker	1.8000e-004	1.1000e-004	1.5800e-003	1.0000e-005	7.4000e-004	0.0000	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.4897	0.4897	1.0000e-005	1.0000e-005	0.4934
Total	**4.3000e-004**	**0.0157**	**4.8800e-003**	**7.0000e-005**	**2.4300e-003**	**1.0000e-004**	**2.5300e-003**	**6.7000e-004**	**1.0000e-004**	**7.7000e-004**	**0.0000**	**6.0778**	**6.0778**	**1.9000e-004**	**8.9000e-004**	**6.3475**

3.9 Glen Arbor Rd Section: Pavement Striping - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0902					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2000e-004	5.1000e-004	7.2000e-004	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.3587	0.3587	1.0000e-005	0.0000	0.3590
Total	**0.0903**	**5.1000e-004**	**7.2000e-004**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.3587**	**0.3587**	**1.0000e-005**	**0.0000**	**0.3590**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.9 Glen Arbor Rd Section: Pavement Striping - 2030

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	2.0000e-005	3.2000e-004	0.0000	1.5000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0979	0.0979	0.0000	0.0000	0.0987
Total	**4.0000e-005**	**2.0000e-005**	**3.2000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.0979**	**0.0979**	**0.0000**	**0.0000**	**0.0987**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0902					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2000e-004	5.1000e-004	7.2000e-004	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.3587	0.3587	1.0000e-005	0.0000	0.3590
Total	**0.0903**	**5.1000e-004**	**7.2000e-004**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.3587**	**0.3587**	**1.0000e-005**	**0.0000**	**0.3590**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.9 Glen Arbor Rd Section: Pavement Striping - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	2.0000e-005	3.2000e-004	0.0000	1.5000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0979	0.0979	0.0000	0.0000	0.0987
Total	**4.0000e-005**	**2.0000e-005**	**3.2000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.0979**	**0.0979**	**0.0000**	**0.0000**	**0.0987**

3.10 Brackney South Section: Staging and Mobilization - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9900e-003	7.9200e-003	0.0295	5.0000e-005		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004	0.0000	4.3614	4.3614	1.6000e-004	0.0000	4.3654
Total	**1.9900e-003**	**7.9200e-003**	**0.0295**	**5.0000e-005**	**0.0000**	**2.2000e-004**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**2.2000e-004**	**0.0000**	**4.3614**	**4.3614**	**1.6000e-004**	**0.0000**	**4.3654**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.10 Brackney South Section: Staging and Mobilization - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	2.0000e-004	3.0200e-003	1.0000e-005	1.4800e-003	1.0000e-005	1.4800e-003	3.9000e-004	1.0000e-005	4.0000e-004	0.0000	0.9578	0.9578	2.0000e-005	2.0000e-005	0.9649
Total	**3.4000e-004**	**2.0000e-004**	**3.0200e-003**	**1.0000e-005**	**1.4800e-003**	**1.0000e-005**	**1.4800e-003**	**3.9000e-004**	**1.0000e-005**	**4.0000e-004**	**0.0000**	**0.9578**	**0.9578**	**2.0000e-005**	**2.0000e-005**	**0.9649**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9900e-003	7.9200e-003	0.0295	5.0000e-005		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004	0.0000	4.3614	4.3614	1.6000e-004	0.0000	4.3654
Total	**1.9900e-003**	**7.9200e-003**	**0.0295**	**5.0000e-005**	**0.0000**	**2.2000e-004**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**2.2000e-004**	**0.0000**	**4.3614**	**4.3614**	**1.6000e-004**	**0.0000**	**4.3654**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.10 Brackney South Section: Staging and Mobilization - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4000e-004	2.0000e-004	3.0200e-003	1.0000e-005	1.4800e-003	1.0000e-005	1.4800e-003	3.9000e-004	1.0000e-005	4.0000e-004	0.0000	0.9578	0.9578	2.0000e-005	2.0000e-005	0.9649
Total	**3.4000e-004**	**2.0000e-004**	**3.0200e-003**	**1.0000e-005**	**1.4800e-003**	**1.0000e-005**	**1.4800e-003**	**3.9000e-004**	**1.0000e-005**	**4.0000e-004**	**0.0000**	**0.9578**	**0.9578**	**2.0000e-005**	**2.0000e-005**	**0.9649**

3.11 Brackney South Section: Pipeline Grading - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.9000e-004	0.0000	9.9000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0126	0.0665	0.1907	3.3000e-004		1.6200e-003	1.6200e-003		1.6200e-003	1.6200e-003	0.0000	28.1985	28.1985	1.0000e-003	0.0000	28.2236
Total	**0.0126**	**0.0665**	**0.1907**	**3.3000e-004**	**9.9000e-004**	**1.6200e-003**	**2.6100e-003**	**1.1000e-004**	**1.6200e-003**	**1.7300e-003**	**0.0000**	**28.1985**	**28.1985**	**1.0000e-003**	**0.0000**	**28.2236**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.11 Brackney South Section: Pipeline Grading - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4000e-003	0.0923	0.0196	3.4000e-004	0.0101	6.5000e-004	0.0107	2.7700e-003	6.2000e-004	3.3800e-003	0.0000	33.7204	33.7204	1.1200e-003	5.3400e-003	35.3406
Vendor	2.0000e-004	9.3400e-003	2.4300e-003	3.0000e-005	1.1800e-003	5.0000e-005	1.2300e-003	3.4000e-004	5.0000e-005	3.9000e-004	0.0000	3.3057	3.3057	7.0000e-005	4.9000e-004	3.4547
Worker	1.3500e-003	8.1000e-004	0.0121	4.0000e-005	5.9100e-003	2.0000e-005	5.9300e-003	1.5700e-003	2.0000e-005	1.5900e-003	0.0000	3.8312	3.8312	7.0000e-005	9.0000e-005	3.8597
Total	**2.9500e-003**	**0.1024**	**0.0341**	**4.1000e-004**	**0.0172**	**7.2000e-004**	**0.0179**	**4.6800e-003**	**6.9000e-004**	**5.3600e-003**	**0.0000**	**40.8574**	**40.8574**	**1.2600e-003**	**5.9200e-003**	**42.6549**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.4000e-004	0.0000	4.4000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0126	0.0665	0.1907	3.3000e-004		1.6200e-003	1.6200e-003		1.6200e-003	1.6200e-003	0.0000	28.1985	28.1985	1.0000e-003	0.0000	28.2235
Total	**0.0126**	**0.0665**	**0.1907**	**3.3000e-004**	**4.4000e-004**	**1.6200e-003**	**2.0600e-003**	**5.0000e-005**	**1.6200e-003**	**1.6700e-003**	**0.0000**	**28.1985**	**28.1985**	**1.0000e-003**	**0.0000**	**28.2235**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.11 Brackney South Section: Pipeline Grading - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4000e-003	0.0923	0.0196	3.4000e-004	0.0101	6.5000e-004	0.0107	2.7700e-003	6.2000e-004	3.3800e-003	0.0000	33.7204	33.7204	1.1200e-003	5.3400e-003	35.3406
Vendor	2.0000e-004	9.3400e-003	2.4300e-003	3.0000e-005	1.1800e-003	5.0000e-005	1.2300e-003	3.4000e-004	5.0000e-005	3.9000e-004	0.0000	3.3057	3.3057	7.0000e-005	4.9000e-004	3.4547
Worker	1.3500e-003	8.1000e-004	0.0121	4.0000e-005	5.9100e-003	2.0000e-005	5.9300e-003	1.5700e-003	2.0000e-005	1.5900e-003	0.0000	3.8312	3.8312	7.0000e-005	9.0000e-005	3.8597
Total	**2.9500e-003**	**0.1024**	**0.0341**	**4.1000e-004**	**0.0172**	**7.2000e-004**	**0.0179**	**4.6800e-003**	**6.9000e-004**	**5.3600e-003**	**0.0000**	**40.8574**	**40.8574**	**1.2600e-003**	**5.9200e-003**	**42.6549**

3.12 San Lorenzo Way Section: Staging and Mobilization - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.9000e-004	3.9600e-003	0.0148	3.0000e-005		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004	0.0000	2.1807	2.1807	8.0000e-005	0.0000	2.1827
Total	**9.9000e-004**	**3.9600e-003**	**0.0148**	**3.0000e-005**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**2.1807**	**2.1807**	**8.0000e-005**	**0.0000**	**2.1827**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.12 San Lorenzo Way Section: Staging and Mobilization - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7000e-004	1.0000e-004	1.5100e-003	1.0000e-005	7.4000e-004	0.0000	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.4789	0.4789	1.0000e-005	1.0000e-005	0.4825
Total	**1.7000e-004**	**1.0000e-004**	**1.5100e-003**	**1.0000e-005**	**7.4000e-004**	**0.0000**	**7.4000e-004**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.4789**	**0.4789**	**1.0000e-005**	**1.0000e-005**	**0.4825**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.9000e-004	3.9600e-003	0.0148	3.0000e-005		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004	0.0000	2.1807	2.1807	8.0000e-005	0.0000	2.1827
Total	**9.9000e-004**	**3.9600e-003**	**0.0148**	**3.0000e-005**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**1.1000e-004**	**0.0000**	**2.1807**	**2.1807**	**8.0000e-005**	**0.0000**	**2.1827**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.12 San Lorenzo Way Section: Staging and Mobilization - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7000e-004	1.0000e-004	1.5100e-003	1.0000e-005	7.4000e-004	0.0000	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.4789	0.4789	1.0000e-005	1.0000e-005	0.4825
Total	**1.7000e-004**	**1.0000e-004**	**1.5100e-003**	**1.0000e-005**	**7.4000e-004**	**0.0000**	**7.4000e-004**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.4789**	**0.4789**	**1.0000e-005**	**1.0000e-005**	**0.4825**

3.13 Brackney South Section: Paving - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.5000e-004	1.7800e-003	3.9600e-003	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.6025	0.6025	3.0000e-005	0.0000	0.6032
Paving	0.0130					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0134**	**1.7800e-003**	**3.9600e-003**	**1.0000e-005**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.6025**	**0.6025**	**3.0000e-005**	**0.0000**	**0.6032**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.13 Brackney South Section: Paving - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.0000e-005	5.7700e-003	1.2200e-003	2.0000e-005	6.3000e-004	4.0000e-005	6.7000e-004	1.7000e-004	4.0000e-005	2.1000e-004	0.0000	2.1093	2.1093	7.0000e-005	3.3000e-004	2.2106
Vendor	0.0000	2.1000e-004	5.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0744	0.0744	0.0000	1.0000e-005	0.0777
Worker	3.0000e-005	2.0000e-005	3.0000e-004	0.0000	1.5000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0958	0.0958	0.0000	0.0000	0.0965
Total	**1.2000e-004**	**6.0000e-003**	**1.5700e-003**	**2.0000e-005**	**8.1000e-004**	**4.0000e-005**	**8.5000e-004**	**2.2000e-004**	**4.0000e-005**	**2.6000e-004**	**0.0000**	**2.2794**	**2.2794**	**7.0000e-005**	**3.4000e-004**	**2.3849**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.5000e-004	1.7800e-003	3.9600e-003	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.6025	0.6025	3.0000e-005	0.0000	0.6032
Paving	0.0130					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0134**	**1.7800e-003**	**3.9600e-003**	**1.0000e-005**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.6025**	**0.6025**	**3.0000e-005**	**0.0000**	**0.6032**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.13 Brackney South Section: Paving - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.0000e-005	5.7700e-003	1.2200e-003	2.0000e-005	6.3000e-004	4.0000e-005	6.7000e-004	1.7000e-004	4.0000e-005	2.1000e-004	0.0000	2.1093	2.1093	7.0000e-005	3.3000e-004	2.2106
Vendor	0.0000	2.1000e-004	5.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0744	0.0744	0.0000	1.0000e-005	0.0777
Worker	3.0000e-005	2.0000e-005	3.0000e-004	0.0000	1.5000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0958	0.0958	0.0000	0.0000	0.0965
Total	**1.2000e-004**	**6.0000e-003**	**1.5700e-003**	**2.0000e-005**	**8.1000e-004**	**4.0000e-005**	**8.5000e-004**	**2.2000e-004**	**4.0000e-005**	**2.6000e-004**	**0.0000**	**2.2794**	**2.2794**	**7.0000e-005**	**3.4000e-004**	**2.3849**

3.14 San Lorenzo Way Section: Pipeline Grading - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2900e-003	0.0000	1.2900e-003	1.5000e-004	0.0000	1.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0141	0.0748	0.2145	3.7000e-004		1.8200e-003	1.8200e-003		1.8200e-003	1.8200e-003	0.0000	31.7234	31.7234	1.1300e-003	0.0000	31.7515
Total	**0.0141**	**0.0748**	**0.2145**	**3.7000e-004**	**1.2900e-003**	**1.8200e-003**	**3.1100e-003**	**1.5000e-004**	**1.8200e-003**	**1.9700e-003**	**0.0000**	**31.7234**	**31.7234**	**1.1300e-003**	**0.0000**	**31.7515**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.14 San Lorenzo Way Section: Pipeline Grading - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.8300e-003	0.1205	0.0255	4.4000e-004	0.0132	8.5000e-004	0.0140	3.6100e-003	8.1000e-004	4.4200e-003	0.0000	44.0137	44.0137	1.4600e-003	6.9700e-003	46.1285
Vendor	2.9000e-004	0.0137	3.5600e-003	5.0000e-005	1.7300e-003	7.0000e-005	1.8100e-003	5.0000e-004	7.0000e-005	5.7000e-004	0.0000	4.8347	4.8347	1.0000e-004	7.2000e-004	5.0525
Worker	1.5200e-003	9.1000e-004	0.0136	5.0000e-005	6.6500e-003	3.0000e-005	6.6700e-003	1.7700e-003	2.0000e-005	1.7900e-003	0.0000	4.3101	4.3101	8.0000e-005	1.0000e-004	4.3421
Total	**3.6400e-003**	**0.1350**	**0.0427**	**5.4000e-004**	**0.0215**	**9.5000e-004**	**0.0225**	**5.8800e-003**	**9.0000e-004**	**6.7800e-003**	**0.0000**	**53.1585**	**53.1585**	**1.6400e-003**	**7.7900e-003**	**55.5230**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.8000e-004	0.0000	5.8000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0141	0.0748	0.2145	3.7000e-004		1.8200e-003	1.8200e-003		1.8200e-003	1.8200e-003	0.0000	31.7233	31.7233	1.1300e-003	0.0000	31.7515
Total	**0.0141**	**0.0748**	**0.2145**	**3.7000e-004**	**5.8000e-004**	**1.8200e-003**	**2.4000e-003**	**7.0000e-005**	**1.8200e-003**	**1.8900e-003**	**0.0000**	**31.7233**	**31.7233**	**1.1300e-003**	**0.0000**	**31.7515**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.14 San Lorenzo Way Section: Pipeline Grading - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.8300e-003	0.1205	0.0255	4.4000e-004	0.0132	8.5000e-004	0.0140	3.6100e-003	8.1000e-004	4.4200e-003	0.0000	44.0137	44.0137	1.4600e-003	6.9700e-003	46.1285
Vendor	2.9000e-004	0.0137	3.5600e-003	5.0000e-005	1.7300e-003	7.0000e-005	1.8100e-003	5.0000e-004	7.0000e-005	5.7000e-004	0.0000	4.8347	4.8347	1.0000e-004	7.2000e-004	5.0525
Worker	1.5200e-003	9.1000e-004	0.0136	5.0000e-005	6.6500e-003	3.0000e-005	6.6700e-003	1.7700e-003	2.0000e-005	1.7900e-003	0.0000	4.3101	4.3101	8.0000e-005	1.0000e-004	4.3421
Total	**3.6400e-003**	**0.1350**	**0.0427**	**5.4000e-004**	**0.0215**	**9.5000e-004**	**0.0225**	**5.8800e-003**	**9.0000e-004**	**6.7800e-003**	**0.0000**	**53.1585**	**53.1585**	**1.6400e-003**	**7.7900e-003**	**55.5230**

3.15 San Lorenzo Way Section: Paving - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.7300e-003	8.9000e-003	0.0198	4.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	3.0124	3.0124	1.4000e-004	0.0000	3.0160
Paving	0.0130					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0147**	**8.9000e-003**	**0.0198**	**4.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**3.0124**	**3.0124**	**1.4000e-004**	**0.0000**	**3.0160**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.15 San Lorenzo Way Section: Paving - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.1000e-004	7.5400e-003	1.6000e-003	3.0000e-005	8.2000e-004	5.0000e-005	8.8000e-004	2.3000e-004	5.0000e-005	2.8000e-004	0.0000	2.7561	2.7561	9.0000e-005	4.4000e-004	2.8886
Vendor	3.0000e-005	1.4000e-003	3.6000e-004	1.0000e-005	1.8000e-004	1.0000e-005	1.9000e-004	5.0000e-005	1.0000e-005	6.0000e-005	0.0000	0.4959	0.4959	1.0000e-005	7.0000e-005	0.5182
Worker	1.7000e-004	1.0000e-004	1.5100e-003	1.0000e-005	7.4000e-004	0.0000	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.4789	0.4789	1.0000e-005	1.0000e-005	0.4825
Total	**3.1000e-004**	**9.0400e-003**	**3.4700e-003**	**5.0000e-005**	**1.7400e-003**	**6.0000e-005**	**1.8100e-003**	**4.8000e-004**	**6.0000e-005**	**5.4000e-004**	**0.0000**	**3.7309**	**3.7309**	**1.1000e-004**	**5.2000e-004**	**3.8892**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.7300e-003	8.9000e-003	0.0198	4.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	3.0124	3.0124	1.4000e-004	0.0000	3.0160
Paving	0.0130					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0147**	**8.9000e-003**	**0.0198**	**4.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**3.0124**	**3.0124**	**1.4000e-004**	**0.0000**	**3.0160**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.15 San Lorenzo Way Section: Paving - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.1000e-004	7.5400e-003	1.6000e-003	3.0000e-005	8.2000e-004	5.0000e-005	8.8000e-004	2.3000e-004	5.0000e-005	2.8000e-004	0.0000	2.7561	2.7561	9.0000e-005	4.4000e-004	2.8886
Vendor	3.0000e-005	1.4000e-003	3.6000e-004	1.0000e-005	1.8000e-004	1.0000e-005	1.9000e-004	5.0000e-005	1.0000e-005	6.0000e-005	0.0000	0.4959	0.4959	1.0000e-005	7.0000e-005	0.5182
Worker	1.7000e-004	1.0000e-004	1.5100e-003	1.0000e-005	7.4000e-004	0.0000	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.4789	0.4789	1.0000e-005	1.0000e-005	0.4825
Total	**3.1000e-004**	**9.0400e-003**	**3.4700e-003**	**5.0000e-005**	**1.7400e-003**	**6.0000e-005**	**1.8100e-003**	**4.8000e-004**	**6.0000e-005**	**5.4000e-004**	**0.0000**	**3.7309**	**3.7309**	**1.1000e-004**	**5.2000e-004**	**3.8892**

3.16 Felton Pump Station Section: Staging and Mobilization - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0000e-004	7.9000e-004	2.9500e-003	1.0000e-005		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.4361	0.4361	2.0000e-005	0.0000	0.4365
Total	**2.0000e-004**	**7.9000e-004**	**2.9500e-003**	**1.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.4361**	**0.4361**	**2.0000e-005**	**0.0000**	**0.4365**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.16 Felton Pump Station Section: Staging and Mobilization - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	3.0000e-004	0.0000	1.5000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0958	0.0958	0.0000	0.0000	0.0965
Total	**3.0000e-005**	**2.0000e-005**	**3.0000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.0958**	**0.0958**	**0.0000**	**0.0000**	**0.0965**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0000e-004	7.9000e-004	2.9500e-003	1.0000e-005		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.4361	0.4361	2.0000e-005	0.0000	0.4365
Total	**2.0000e-004**	**7.9000e-004**	**2.9500e-003**	**1.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.4361**	**0.4361**	**2.0000e-005**	**0.0000**	**0.4365**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.16 Felton Pump Station Section: Staging and Mobilization - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	3.0000e-004	0.0000	1.5000e-004	0.0000	1.5000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0958	0.0958	0.0000	0.0000	0.0965
Total	**3.0000e-005**	**2.0000e-005**	**3.0000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.0958**	**0.0958**	**0.0000**	**0.0000**	**0.0965**

3.17 Felton Pump Station Section: Grading - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.0000e-004	0.0000	6.0000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0126	0.0665	0.1907	3.3000e-004		1.6200e-003	1.6200e-003		1.6200e-003	1.6200e-003	0.0000	28.1985	28.1985	1.0000e-003	0.0000	28.2236
Total	**0.0126**	**0.0665**	**0.1907**	**3.3000e-004**	**6.0000e-004**	**1.6200e-003**	**2.2200e-003**	**7.0000e-005**	**1.6200e-003**	**1.6900e-003**	**0.0000**	**28.1985**	**28.1985**	**1.0000e-003**	**0.0000**	**28.2236**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.17 Felton Pump Station Section: Grading - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.5000e-004	0.0560	0.0119	2.1000e-004	6.1100e-003	3.9000e-004	6.5000e-003	1.6800e-003	3.8000e-004	2.0500e-003	0.0000	20.4460	20.4460	6.8000e-004	3.2400e-003	21.4284
Vendor	1.2000e-004	5.6000e-003	1.4600e-003	2.0000e-005	7.1000e-004	3.0000e-005	7.4000e-004	2.1000e-004	3.0000e-005	2.3000e-004	0.0000	1.9835	1.9835	4.0000e-005	3.0000e-004	2.0728
Worker	1.3500e-003	8.1000e-004	0.0121	4.0000e-005	5.9100e-003	2.0000e-005	5.9300e-003	1.5700e-003	2.0000e-005	1.5900e-003	0.0000	3.8312	3.8312	7.0000e-005	9.0000e-005	3.8597
Total	**2.3200e-003**	**0.0624**	**0.0254**	**2.7000e-004**	**0.0127**	**4.4000e-004**	**0.0132**	**3.4600e-003**	**4.3000e-004**	**3.8700e-003**	**0.0000**	**26.2607**	**26.2607**	**7.9000e-004**	**3.6300e-003**	**27.3608**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.7000e-004	0.0000	2.7000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0126	0.0665	0.1907	3.3000e-004		1.6200e-003	1.6200e-003		1.6200e-003	1.6200e-003	0.0000	28.1985	28.1985	1.0000e-003	0.0000	28.2235
Total	**0.0126**	**0.0665**	**0.1907**	**3.3000e-004**	**2.7000e-004**	**1.6200e-003**	**1.8900e-003**	**3.0000e-005**	**1.6200e-003**	**1.6500e-003**	**0.0000**	**28.1985**	**28.1985**	**1.0000e-003**	**0.0000**	**28.2235**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.17 Felton Pump Station Section: Grading - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.5000e-004	0.0560	0.0119	2.1000e-004	6.1100e-003	3.9000e-004	6.5000e-003	1.6800e-003	3.8000e-004	2.0500e-003	0.0000	20.4460	20.4460	6.8000e-004	3.2400e-003	21.4284
Vendor	1.2000e-004	5.6000e-003	1.4600e-003	2.0000e-005	7.1000e-004	3.0000e-005	7.4000e-004	2.1000e-004	3.0000e-005	2.3000e-004	0.0000	1.9835	1.9835	4.0000e-005	3.0000e-004	2.0728
Worker	1.3500e-003	8.1000e-004	0.0121	4.0000e-005	5.9100e-003	2.0000e-005	5.9300e-003	1.5700e-003	2.0000e-005	1.5900e-003	0.0000	3.8312	3.8312	7.0000e-005	9.0000e-005	3.8597
Total	**2.3200e-003**	**0.0624**	**0.0254**	**2.7000e-004**	**0.0127**	**4.4000e-004**	**0.0132**	**3.4600e-003**	**4.3000e-004**	**3.8700e-003**	**0.0000**	**26.2607**	**26.2607**	**7.9000e-004**	**3.6300e-003**	**27.3608**

3.18 Felton Pump Station Section: Paving - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.7300e-003	8.9000e-003	0.0198	4.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	3.0124	3.0124	1.4000e-004	0.0000	3.0160
Paving	0.0130					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0147**	**8.9000e-003**	**0.0198**	**4.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**3.0124**	**3.0124**	**1.4000e-004**	**0.0000**	**3.0160**

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3.18 Felton Pump Station Section: Paving - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	3.5400e-003	7.5000e-004	1.0000e-005	3.9000e-004	2.0000e-005	4.1000e-004	1.1000e-004	2.0000e-005	1.3000e-004	0.0000	1.2937	1.2937	4.0000e-005	2.0000e-004	1.3559
Vendor	1.0000e-005	7.0000e-004	1.8000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	3.0000e-005	0.0000	3.0000e-005	0.0000	0.2479	0.2479	1.0000e-005	4.0000e-005	0.2591
Worker	1.7000e-004	1.0000e-004	1.5100e-003	1.0000e-005	7.4000e-004	0.0000	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.4789	0.4789	1.0000e-005	1.0000e-005	0.4825
Total	**2.3000e-004**	**4.3400e-003**	**2.4400e-003**	**2.0000e-005**	**1.2200e-003**	**2.0000e-005**	**1.2400e-003**	**3.4000e-004**	**2.0000e-005**	**3.6000e-004**	**0.0000**	**2.0205**	**2.0205**	**6.0000e-005**	**2.5000e-004**	**2.0974**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.7300e-003	8.9000e-003	0.0198	4.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	3.0124	3.0124	1.4000e-004	0.0000	3.0160
Paving	0.0130					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0147**	**8.9000e-003**	**0.0198**	**4.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**3.0124**	**3.0124**	**1.4000e-004**	**0.0000**	**3.0160**

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3.18 Felton Pump Station Section: Paving - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	3.5400e-003	7.5000e-004	1.0000e-005	3.9000e-004	2.0000e-005	4.1000e-004	1.1000e-004	2.0000e-005	1.3000e-004	0.0000	1.2937	1.2937	4.0000e-005	2.0000e-004	1.3559
Vendor	1.0000e-005	7.0000e-004	1.8000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	3.0000e-005	0.0000	3.0000e-005	0.0000	0.2479	0.2479	1.0000e-005	4.0000e-005	0.2591
Worker	1.7000e-004	1.0000e-004	1.5100e-003	1.0000e-005	7.4000e-004	0.0000	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.4789	0.4789	1.0000e-005	1.0000e-005	0.4825
Total	**2.3000e-004**	**4.3400e-003**	**2.4400e-003**	**2.0000e-005**	**1.2200e-003**	**2.0000e-005**	**1.2400e-003**	**3.4000e-004**	**2.0000e-005**	**3.6000e-004**	**0.0000**	**2.0205**	**2.0205**	**6.0000e-005**	**2.5000e-004**	**2.0974**

3.19 Felton Pump Station Section: Pavement Striping - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0902					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4000e-004	1.0300e-003	1.4400e-003	1.0000e-005		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.7174	0.7174	2.0000e-005	0.0000	0.7179
Total	**0.0905**	**1.0300e-003**	**1.4400e-003**	**1.0000e-005**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.7174**	**0.7174**	**2.0000e-005**	**0.0000**	**0.7179**

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3.19 Felton Pump Station Section: Pavement Striping - 2031

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	4.0000e-005	6.0000e-004	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.1916	0.1916	0.0000	0.0000	0.1930
Total	**7.0000e-005**	**4.0000e-005**	**6.0000e-004**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.1916**	**0.1916**	**0.0000**	**0.0000**	**0.1930**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0902					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4000e-004	1.0300e-003	1.4400e-003	1.0000e-005		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.7174	0.7174	2.0000e-005	0.0000	0.7179
Total	**0.0905**	**1.0300e-003**	**1.4400e-003**	**1.0000e-005**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.7174**	**0.7174**	**2.0000e-005**	**0.0000**	**0.7179**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.19 Felton Pump Station Section: Pavement Striping - 2031

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	4.0000e-005	6.0000e-004	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.1916	0.1916	0.0000	0.0000	0.1930
Total	**7.0000e-005**	**4.0000e-005**	**6.0000e-004**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.1916**	**0.1916**	**0.0000**	**0.0000**	**0.1930**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.552058	0.056962	0.193821	0.123008	0.021404	0.005318	0.010231	0.003525	0.000574	0.000778	0.028458	0.000952	0.002912

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0280	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Unmitigated	0.0280	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0280					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Total	**0.0280**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.6000e-004**

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0280					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Total	**0.0280**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.6000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

Newell Creek Pipeline Construction - Long Term - Santa Cruz County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Newell Creek Pipeline Construction - Long Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Santa Cruz County, Mitigation Report

Construction Mitigation Summary

Newell Creek Pipeline Construction - Long Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Phase	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Brackney South Section: Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brackney South Section: Pipeline Grading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brackney South Section: Staging and Mobilization	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Felton Pump Station Section: Grading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Felton Pump Station Section: Pavement Striping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Felton Pump Station Section: Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Felton Pump Station Section: Staging and Mobilization	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Glen Arbor Rd Section: Pavement Striping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Glen Arbor Rd Section: Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Glen Arbor Rd Section: Pipeline Grading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Glen Arbor Rd Section: Staging and Mobilization	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Newell Creek Rd Section: Pavement Striping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Newell Creek Rd Section: Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Newell Creek Rd Section: Pipeline Grading/ Install	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Newell Creek Rd Section: Staging and Mobilization	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
San Lorenzo Way Section: Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
San Lorenzo Way Section: Pipeline Grading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
San Lorenzo Way Section: Staging and Mobilization	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Newell Creek Pipeline Construction - Long Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

OFFROAD Equipment Mitigation

Equipment Type	Fuel Type	Tier	Number Mitigated	Total Number of Equipment	DPF	Oxidation Catalyst
Air Compressors	Diesel	No Change	0	0	No Change	0.00
Excavators	Diesel	No Change	0	10	No Change	0.00
Graders	Diesel	No Change	0	0	No Change	0.00
Pavers	Diesel	No Change	0	5	No Change	0.00
Paving Equipment	Diesel	No Change	0	5	No Change	0.00
Rollers	Diesel	No Change	0	5	No Change	0.00
Rubber Tired Dozers	Diesel	No Change	0	0	No Change	0.00
Tractors/Loaders/Backhoes	Diesel	No Change	0	10	No Change	0.00
Concrete/Industrial Saws	Diesel	No Change	0	5	No Change	0.00
Surfacing Equipment	Diesel	No Change	0	3	No Change	0.00

Newell Creek Pipeline Construction - Long Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Unmitigated tons/yr						Unmitigated mt/yr					
Air Compressors	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Concrete/Industrial Saws	3.05400E-002	2.30350E-001	4.80870E-001	8.30000E-004	4.97000E-003	4.97000E-003	0.00000E+000	7.12395E+001	7.12395E+001	2.38000E-003	0.00000E+000	7.12990E+001
Excavators	3.25900E-002	8.03300E-002	5.14430E-001	9.20000E-004	3.52000E-003	3.52000E-003	0.00000E+000	7.88870E+001	7.88870E+001	2.64000E-003	0.00000E+000	7.89529E+001
Graders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Pavers	3.03000E-003	1.44100E-002	3.36300E-002	6.00000E-005	7.50000E-004	7.50000E-004	0.00000E+000	5.21289E+000	5.21289E+000	2.50000E-004	0.00000E+000	5.21908E+000
Paving Equipment	2.55000E-003	1.19900E-002	2.90900E-002	5.00000E-005	6.20000E-004	6.20000E-004	0.00000E+000	4.53694E+000	4.53694E+000	2.10000E-004	0.00000E+000	4.54212E+000
Rollers	1.68000E-003	1.09800E-002	2.04900E-002	3.00000E-005	3.70000E-004	3.70000E-004	0.00000E+000	2.90242E+000	2.90242E+000	1.40000E-004	0.00000E+000	2.90586E+000
Rubber Tired Dozers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Surfacing Equipment	4.70000E-004	2.05000E-003	2.87000E-003	1.00000E-005	7.00000E-005	7.00000E-005	0.00000E+000	1.43484E+000	1.43484E+000	4.00000E-005	0.00000E+000	1.43579E+000
Tractors/Loaders/Backhoes	2.48800E-002	1.48540E-001	3.38890E-001	5.50000E-004	2.74000E-003	2.74000E-003	0.00000E+000	4.71561E+001	4.71561E+001	1.99000E-003	0.00000E+000	4.72059E+001

Newell Creek Pipeline Construction - Long Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Mitigated tons/yr						Mitigated mt/yr					
Air Compressors	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Concrete/Industrial Saws	3.05400E-002	2.30350E-001	4.80870E-001	8.30000E-004	4.97000E-003	4.97000E-003	0.00000E+000	7.12394E+001	7.12394E+001	2.38000E-003	0.00000E+000	7.12989E+001
Excavators	3.25900E-002	8.03300E-002	5.14430E-001	9.20000E-004	3.52000E-003	3.52000E-003	0.00000E+000	7.88869E+001	7.88869E+001	2.64000E-003	0.00000E+000	7.89528E+001
Graders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Pavers	3.03000E-003	1.44100E-002	3.36300E-002	6.00000E-005	7.50000E-004	7.50000E-004	0.00000E+000	5.21289E+000	5.21289E+000	2.50000E-004	0.00000E+000	5.21908E+000
Paving Equipment	2.55000E-003	1.19900E-002	2.90900E-002	5.00000E-005	6.20000E-004	6.20000E-004	0.00000E+000	4.53693E+000	4.53693E+000	2.10000E-004	0.00000E+000	4.54212E+000
Rollers	1.68000E-003	1.09800E-002	2.04900E-002	3.00000E-005	3.70000E-004	3.70000E-004	0.00000E+000	2.90241E+000	2.90241E+000	1.40000E-004	0.00000E+000	2.90586E+000
Rubber Tired Dozers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Surfacing Equipment	4.70000E-004	2.05000E-003	2.87000E-003	1.00000E-005	7.00000E-005	7.00000E-005	0.00000E+000	1.43484E+000	1.43484E+000	4.00000E-005	0.00000E+000	1.43579E+000
Tractors/Loaders/Backhoes	2.48800E-002	1.48540E-001	3.38890E-001	5.50000E-004	2.74000E-003	2.74000E-003	0.00000E+000	4.71561E+001	4.71561E+001	1.99000E-003	0.00000E+000	4.72059E+001

Newell Creek Pipeline Construction - Long Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Air Compressors	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Concrete/Industrial Saws	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.12297E-006	1.12297E-006	0.00000E+000	0.00000E+000	1.26229E-006
Excavators	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.14087E-006	1.14087E-006	0.00000E+000	0.00000E+000	1.13992E-006
Graders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Pavers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Paving Equipment	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	2.20413E-006	2.20413E-006	0.00000E+000	0.00000E+000	0.00000E+000
Rollers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	3.44540E-006	3.44540E-006	0.00000E+000	0.00000E+000	0.00000E+000
Rubber Tired Dozers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Surfacing Equipment	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Tractors/Loaders/Backhoes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.06031E-006	1.06031E-006	0.00000E+000	0.00000E+000	1.27103E-006

Fugitive Dust Mitigation

Yes/No	Mitigation Measure	Mitigation Input		Mitigation Input		Mitigation Input	
No	Soil Stabilizer for unpaved Roads	PM10 Reduction	0.00	PM2.5 Reduction	0.00		
No	Replace Ground Cover of Area Disturbed	PM10 Reduction	0.00	PM2.5 Reduction	0.00		
Yes	Water Exposed Area	PM10 Reduction	55.00	PM2.5 Reduction	55.00	Frequency (per day)	2.00

Newell Creek Pipeline Construction - Long Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

No	Unpaved Road Mitigation	Moisture Content %	0.00	Vehicle Speed (mph)	0.00		
No	Clean Paved Road	% PM Reduction	0.00				

		Unmitigated		Mitigated		Percent Reduction	
Phase	Source	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Brackney South Section: Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Brackney South Section: Paving	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Brackney South Section: Pipeline Grading	Fugitive Dust	0.00	0.00	0.00	0.00	0.56	0.55
Brackney South Section: Pipeline Grading	Roads	0.02	0.00	0.02	0.00	0.00	0.00
Brackney South Section: Staging and Mobilization	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Brackney South Section: Staging and Mobilization	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Felton Pump Station Section: Grading	Fugitive Dust	0.00	0.00	0.00	0.00	0.55	0.57
Felton Pump Station Section: Grading	Roads	0.01	0.00	0.01	0.00	0.00	0.00
Felton Pump Station Section: Pavement Striping	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Felton Pump Station Section: Pavement Striping	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Felton Pump Station Section: Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Felton Pump Station Section: Paving	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Felton Pump Station Section: Staging and Mobilization	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Felton Pump Station Section: Staging and Mobilization	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Glen Arbor Rd Section: Pavement Striping	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Glen Arbor Rd Section: Pavement Striping	Roads	0.00	0.00	0.00	0.00	0.00	0.00

Newell Creek Pipeline Construction - Long Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Glen Arbor Rd Section: Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Glen Arbor Rd Section: Paving	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Glen Arbor Rd Section: Pipeline Grading	Fugitive Dust	0.00	0.00	0.00	0.00	0.55	0.56
Glen Arbor Rd Section: Pipeline Grading	Roads	0.04	0.01	0.04	0.01	0.00	0.00
Glen Arbor Rd Section: Staging and Mobilization	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Glen Arbor Rd Section: Staging and Mobilization	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Newell Creek Rd Section: Pavement Striping	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Newell Creek Rd Section: Pavement Striping	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Newell Creek Rd Section: Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Newell Creek Rd Section: Paving	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Newell Creek Rd Section: Pipeline Grading/ Install	Fugitive Dust	0.00	0.00	0.00	0.00	0.55	0.56
Newell Creek Rd Section: Pipeline Grading/ Install	Roads	0.03	0.01	0.03	0.01	0.00	0.00
Newell Creek Rd Section: Staging and Mobilization	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Newell Creek Rd Section: Staging and Mobilization	Roads	0.00	0.00	0.00	0.00	0.00	0.00
San Lorenzo Way Section: Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
San Lorenzo Way Section: Paving	Roads	0.00	0.00	0.00	0.00	0.00	0.00
San Lorenzo Way Section: Pipeline Grading	Fugitive Dust	0.00	0.00	0.00	0.00	0.55	0.53
San Lorenzo Way Section: Pipeline Grading	Roads	0.02	0.01	0.02	0.01	0.00	0.00
San Lorenzo Way Section: Staging and Mobilization	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
San Lorenzo Way Section: Staging and Mobilization	Roads	0.00	0.00	0.00	0.00	0.00	0.00

Newell Creek Pipeline Construction - Long Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Operational Percent Reduction Summary

Category	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Indoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Outdoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Operational Mobile Mitigation

Project Setting:

Mitigation	Category	Measure	% Reduction	Input Value 1	Input Value 2	Input Value 3
No	Land Use	Increase Density	0.00			
No	Land Use	Increase Diversity	0.00	0.15		
No	Land Use	Improve Walkability Design	0.00			
No	Land Use	Improve Destination Accessibility	0.00			
No	Land Use	Increase Transit Accessibility	0.25			
No	Land Use	Integrate Below Market Rate Housing	0.00			

Newell Creek Pipeline Construction - Long Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Land Use	Land Use SubTotal	0.00			
No	Neighborhood Enhancements	Improve Pedestrian Network				
No	Neighborhood Enhancements	Provide Traffic Calming Measures	0.00			
No	Neighborhood Enhancements	Implement NEV Network	0.00			
	Neighborhood Enhancements	Neighborhood Enhancements Subtotal	0.00			
No	Parking Policy Pricing	Limit Parking Supply	0.00			
No	Parking Policy Pricing	Unbundle Parking Costs	0.00			
No	Parking Policy Pricing	On-street Market Pricing	0.00			
	Parking Policy Pricing	Parking Policy Pricing Subtotal	0.00			
No	Transit Improvements	Provide BRT System	0.00			
No	Transit Improvements	Expand Transit Network	0.00			
No	Transit Improvements	Increase Transit Frequency	0.00			
	Transit Improvements	Transit Improvements Subtotal	0.00			
		Land Use and Site Enhancement Subtotal	0.00			
No	Commute	Implement Trip Reduction Program				
No	Commute	Transit Subsidy				
No	Commute	Implement Employee Parking "Cash Out"				
No	Commute	Workplace Parking Charge				
No	Commute	Encourage Telecommuting and Alternative Work Schedules	0.00			
No	Commute	Market Commute Trip Reduction Option	0.00			

Newell Creek Pipeline Construction - Long Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

No	Commute	Employee Vanpool/Shuttle	0.00		2.00	
No	Commute	Provide Ride Sharing Program				
	Commute	Commute Subtotal	0.00			
No	School Trip	Implement School Bus Program	0.00			
		Total VMT Reduction	0.00			

Area Mitigation

Measure Implemented	Mitigation Measure	Input Value
No	Only Natural Gas Hearth	
No	No Hearth	
No	Use Low VOC Cleaning Supplies	
No	Use Low VOC Paint (Residential Interior)	100.00
No	Use Low VOC Paint (Residential Exterior)	100.00
No	Use Low VOC Paint (Non-residential Interior)	150.00
No	Use Low VOC Paint (Non-residential Exterior)	150.00
No	Use Low VOC Paint (Parking)	150.00
No	% Electric Lawnmower	
No	% Electric Leafblower	
No	% Electric Chainsaw	

Energy Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2

Newell Creek Pipeline Construction - Long Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

No	Exceed Title 24		
No	Install High Efficiency Lighting		
No	On-site Renewable		

Appliance Type	Land Use Subtype	% Improvement
ClothWasher		30.00
DishWasher		15.00
Fan		50.00
Refrigerator		15.00

Water Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Apply Water Conservation on Strategy		
No	Use Reclaimed Water		
No	Use Grey Water		
No	Install low-flow bathroom faucet	32.00	
No	Install low-flow Kitchen faucet	18.00	
No	Install low-flow Toilet	20.00	
No	Install low-flow Shower	20.00	
No	Turf Reduction		
No	Use Water Efficient Irrigation Systems	6.10	
No	Water Efficient Landscape		

Newell Creek Pipeline Construction - Long Term

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Solid Waste Mitigation

Mitigation Measures	Input Value
Institute Recycling and Composting Services Percent Reduction in Waste Disposed	