



SAN FRANCISCO PLANNING DEPARTMENT

Addendum 2 to Mitigated Negative Declaration

Date of Publication of the Addendum: February 21, 2019

Date of Final FMND: May 2, 2016

Case No.: 2013.1761E

Project Title: PG&E Gas Transmission Line 109 Cañada Road, Bunker Hill,
and Crystal Springs Pipeline Replacement Project, San Mateo County

Zoning: Resource Management

Block/Lot: Various

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BACKGROUND

On May 2, 2016, the San Francisco Planning Department issued the Pacific Gas and Electric Company (PG&E) Gas Transmission Line 109 Cañada Road, Bunker Hill, and Crystal Springs Pipeline Replacement Final Mitigated Negative Declaration (FMND), Case No. 2013.1761E. In June 2016, the project sponsor received Revocable License #4247 (License) from the San Francisco Public Utilities District (SFPUC) for the replacement of Gas Transmission Pipeline 109 (L109), for the project analyzed in the FMND.

The project includes three linear segments that together total 4.7 miles. The segments are denominated, from north to south, Crystal Springs, Bunker Hill, and Cañada Road. The project sites and surroundings consist of undeveloped rolling hills covered in oak woodland, grassland, chaparral, and mixed evergreen forest. The project area is zoned RM (Recreation Management) and is designated as Parks/Open Space in the San Mateo County General Plan. The project is entirely within San Francisco Public Utility Commission (SFPUC) Peninsula Watershed lands within unincorporated San Mateo County Watershed lands—used for water collection, storage, and quality protection—that are off limits to the public, except along hiking trails that were jointly established by the SFPUC, U.S. Department of the Interior, California Department of Transportation, and San Mateo County.

As analyzed in the FMND, the project involves issuance of temporary and permanent easements from the City and County of San Francisco to construct the Gas Transmission Line 109 Cañada Road, Bunker Hill, and Crystal Springs Pipeline Replacement Project. It involves replacing existing underground natural gas pipeline across. Specifically, the existing 22-inch-diameter pipeline would be replaced with 24-inch-diameter and (for short stretches) 30-inch-diameter pipes to facilitate use of an automated in-line inspection tool ("pig") for future pipeline integrity testing.

The new pipeline was to be installed using a combination of cut-and-cover open trench construction and horizontal directional drilling. As described in the FMND, pipeline replacement adjacent and parallel to the existing pipeline was proposed, with four exceptions: 1) approximately 0.37 mile of pipeline along the Cañada Road segment, which would be replaced in a new alignment to avoid impacts to biological resources; 2) approximately 2,300 feet of trenchless (drilled) pipeline along the Bunker Hill segment, which would deviate approximately 42 feet from the existing pipeline to avoid a rare plant population; 3) an approximately 200-foot-long section of pipeline at the northern end of the Bunker Hill segment, which would be rerouted to avoid several constraints associated with existing electric transmission towers, an electric substation, and Interstate Highway 280; and 4) the Crystal Springs segment, which would be replaced in place. The FMND stated that the construction period was expected to last approximately 15 months for all three segments, or approximately 5 to 7 months per segment.

Under an addendum issued in March 2017 (Addendum 1), minor modifications to the Crystal Springs segment of the project were approved. Modification included construction of the replacement pipeline for the 1.2-mile-long Crystal Springs segment in a parallel alignment, offset 5 to 7 feet from the existing pipeline, rather than in the then-existing alignment as originally proposed. Under Addendum 1, the existing L109 pipeline in this stretch was abandoned in place and filled with concrete slurry after construction of the replacement pipeline. Addendum 1 also addressed issuance by SFPUC for a new permanent 3.7-acre pipeline easement for the modified alignment. These changes did not entail the use of additional temporary work space or construction staging area, or an increase in area of ground disturbance, and the same access routes to and along the pipeline alignment as were covered in the original FMND were used for the modified project.

Construction of the Crystal Springs and Bunker Hill segments has been completed, consistent with the requirements of the FMND and FMND Addendum 1. These were considered to be within the scope of the original project. With the exception of tree replanting, which is discussed in detail below, vegetation restoration in the areas disturbed by construction in these segments is presently underway.

PROPOSED PROJECT REVISIONS UNDER SECOND ADDENDUM

This addendum addresses project modifications for construction of the Cañada Road segment of the original project. Construction work on the portions of the Cañada Road segment not affected by the revisions analyzed in this addendum is underway (see figures in Attachment A). Construction of the Bunker Hill and Crystal Springs Road segments of the project has been completed.

Several revisions to the Cañada Road segment of the project have been proposed (for locations, see figures in Attachment A). This addendum analyzes the following proposed modifications to the Cañada Road segment of the project: 1) 400-linear foot reduction in the length of trenching and commensurate extension in the length of (trenchless) horizontal directional drilling (HDD); 2) installation of temporary forestry bridges at several drainage crossings; 3) extension of the construction work week on the Cañada Road segment to include Sundays, with use of Sheep Camp Trail for Sunday construction access; and 4) modifications to biological resources **Mitigation Measure BI-1f- Habitat Protection Measures (Attachment B)** to reflect the determination that tree restoration would need to take place off-site rather than at the construction sites in the Peninsula Watershed.

Creek crossing locations where temporary forestry bridges would be installed, which are distributed along the Cañada Road alignment, are illustrated on Figures 1 through 6 (**Attachment A**). The alignment section where HDD construction would replace trenching is illustrated on Figure 4 in **Attachment A**. The locations of proposed off-site vegetation restoration, in San Mateo County Parks Department Wunderlich Park, Woodside, are illustrated in **Attachment C**, Vegetation Restoration Plan, Part 2.

The proposed changes in project construction methods would result in a negligible net reduction in the total area of vegetation removal (removal of two fewer trees than anticipated), and a minor reduction in grading and excavation. The proposed modifications would not entail changes in the pipeline alignment beyond those addressed in the FMND and Addendum 1.

The proposed revisions to biological resources mitigation measures BI-1f are not anticipated to result in new significant impacts not identified in the MND or increase the severity of previously-identified impacts, as discussed in resource analysis sections below.

REQUIRED APPROVALS

The following project approvals by federal, State, and local agencies would be required for implementation of the project described in this Addendum 2:

Federal

- **U.S. Army Corps of Engineers** - Clean Water Act (CWA) Section 404 Nationwide Permit 12: Utility Line Activities
- **U.S. Fish and Wildlife Service** - federal Endangered Species Act Section 7 consultation
- **U.S. Department of the Interior** - Golden Gate National Recreation Area Scenic Easement and Scenic and Recreation Easement concurrence

State

- **California Department of Fish and Wildlife** - California Fish and Game Code Section 1602 Lake or Streambed Alteration Agreement
- **State Regional Water Quality Control Board (San Francisco Region)** - Section 401 water quality certification;
- **State Water Resources Control Board** - CWA Section 402 Permits National Pollutant Discharge Elimination System Program – General Construction Storm Water Permit
- **California Department of Forestry (CalFire)** - Timber Harvest Plan

Local

- **County of San Mateo Parks Department**
 - Approval of the Vegetation Restoration Plan by the San Mateo County Parks Commission
 - Memorandum of Agreement with PG&E on implementation of the Vegetation Restoration Plan as reflected in modified Mitigation Measure BI-1f
- **San Francisco Public Utilities Commission (SFPUC)**
 - Watershed Access Permit including construction access use of Sheep Camp trail on Sundays;
 - Revocable license for limited tree replanting on the SFPUC lands on Peninsula Watershed or other SFPUC lands

DETAILED PROJECT DESCRIPTION

The proposed project revisions are described in further detail below. The locations of the proposed changes are shown on figures provided in Attachment A, Figures 1 through 6.

Reduction in Trenching and Increase in Directional Drilling

North of the Pulgas Balancing Reservoir, PG&E proposes to extend horizontal direction drilling (HDD) for pipeline installation approximately 400 feet further northward of the prior northern end of the drilled section, between approximately stations 77+00 and 81+00 (Attachment A Figure 4). With this revision, open cut trenching along the pipeline alignment between these stations would not be needed, and the width of the work area in this section of the alignment would be reduced. The HDD receiving pit could be accommodated in the previously-approved work area near Station 81+00, and no expansion of this work area would be needed. The proposed revisions in this area would avoid the previously-anticipated removal of two trees and trimming of one tree.

Temporary Drainage Bridges

In the FMND, use of a temporary forestry bridge for equipment access was described only at drainage Cañ-D6. PG&E has clarified that installation of additional temporary bridges at drainages Cañ-D2, -D4, -D5 and -D9 would be required for equipment access along the alignment for construction. Although the use of bridges at these locations was not described in the FMND, these bridges were anticipated as part of the original project, and the work areas for these project elements was included in the work areas analyzed in the FMND. No temporary bridges are proposed for drainages Cañ-D3 or -D6, as these would be accessed from either side. Bridge installation would entail ground disturbance of approximately 130 square feet at each drainage crossing. At drainages Cañ-D4 and -D5, riparian vegetation would be disturbed, while grassland/coyote brush scrub would be disturbed at drainages Cañ-D2 and -D9. At each location to be bridged, each end of the bridge would be keyed (excavated) into the bank of the drainage. About 19 cubic yards of excavation would be needed at each location to set the bridge with the proper support but supports would not be installed within any channel. Construction bridges would be removed at the conclusion of construction and the drainage bed and banks would be recontoured and topography and vegetation would be restored to approximately pre-project conditions.

Sunday Construction

Under the FMND, construction work was expected to extend from 7:00 AM to 5:30 PM, Mondays through Saturdays: Sunday work was not anticipated. However, in order to maintain schedule for hydrotesting of the pipeline, the project sponsor has determined that it may be necessary to extend construction work week and work day schedules to seven days per week, from 7:00 AM to 6:00 PM.

To avoid conflicts with Sunday recreational uses, Cañada Road, which is closed to vehicles on Sundays to allow unimpeded bicycle and pedestrian use, would not be used for construction access on Sundays. Instead, an alternative access route—Sheep Camp Trail, from the Vista Point exit from I-280—would be used for work area access on Sundays. The FMND anticipated that the affected portion of Sheep Camp Trail would be closed to the public for the duration of construction for weekday construction access as needed; this would not change under the proposed project modification. Construction equipment use and noise levels would not change from those analyzed in the FMND, and would remain below San Mateo County’s construction noise thresholds, including weekend construction noise thresholds.

Modifications to Oak Woodland Restoration Mitigation Measures

As identified in the FMND, the Line 109 project would result in the removal of approximately 850 trees, including some 600 oak trees. Removal of oak woodland was identified both as an impact to oak woodland habitat, and as a potential conflict with County of San Mateo and California tree preservation ordinances.

FMND **Mitigation Measure BI-1f- Habitat Protection Measures**, requires preparation of a Vegetation Restoration Plan for on-site restoration of sensitive habitats and plant communities (including coast live oak woodland) at a minimum 1:1 ratio; replacement of native oak trees at a 3:1 ratio, and replacement of significant and heritage non-native trees (that is, generally, trees greater than 12-inches-diameter breast height (DBH)) with native tree species. The FMND considers all oaks with diameters greater than 5 inches. The mitigation measure assumes that replanting would be implemented immediately following construction, and states that additional plantings of shrubs and tree propagules would be implemented in the appropriate plant communities during the fall or winter immediately following construction. Native trees and shrubs with different growth rates would be planted, to minimize the temporal loss of

trees and shrubs and thus ensure that nest and roost sites will be available in the short term for birds and bats. Modification to this measure are now proposed, as detailed below and set forth in the text of the amended measure, which is provided as **Attachment B** to this addendum.

FMND Mitigation Measure BI-5, Pre-construction Tree Surveys and Tree Removal, specifies that all significant or heritage trees (as defined by San Mateo County ordinance), irrespective of species, shall be replaced at a 3:1 ratio and that replanted trees shall be monitored for a minimum of seven years. This measure was intended to mitigate for loss of significant and heritage trees. Under this mitigation measure, a tree inventory (species and diameter breast height [DBH] of each oak and riparian woodland tree removed) was to be conducted prior to the start of any construction activities. This measure would be implemented as previously approved.

Circumstances with respect to tree replanting have changed or been clarified since the FMND was adopted, and new information is available, as follows:

- The FMND assumed that tree replanting likely could occur on SFPUC watershed lands. However, consistent with the goals and policies of its Watershed Management Plan¹ and Stewardship Policy², SFPUC has adopted best management practices under which SFPUC no longer plants trees or tree seedlings on its watershed lands or allows such planting by third parties. Tree seed planting or replanting in or immediately adjacent to native grasslands also is not permitted. These practices were adopted specifically to prevent the potential introduction of invasive species and pathogens, and to avoid introduction of trees in historic or existing grasslands on the watershed. Furthermore, PG&E's pipeline safety requirements also prohibit tree planting within the pipeline right of way above the pipeline; thus, most trees that were removed cannot be replaced in the existing woodland footprint. Further, because the mitigation measures require replanting of a larger number of trees than were removed, either a larger area than the project footprint would be required for replanting, or trees would have to be replanted much more densely than in the affected woodland. Because of these requirements, replanting on the Peninsula Watershed would require planting of trees outside of

¹ Final Peninsula Watershed Management Plan. San Francisco Public Utilities Commission, prepared by EDAW for SFPUC, Spring 2002. Applicable policies include Watershed Management Plan policies V7 (*Protect and restore unique local and/or indigenous plant species to maintain biodiversity and specialized habitat values*) and V10 (*Manage grasslands...[to] support wildlife habitat values, the restoration of native perennial species, and the reduction of fuel loads and noxious weeds*).

existing woodland areas, including in areas that presently are grassland. Replanting outside of the existing woodland footprint would result in the conversion of grasslands to oak woodland, which would be contrary to SFPUC's efforts to restore and enhance rare native grasslands on the watershed and would be inconsistent with SFPUC's Stewardship Policy and Watershed Management Plan³. This mitigation concept therefore has been determined not to be feasible. Therefore, tree replanting required under revised **Mitigation Measure BI-1f (Attachment B** to this document) would be implemented as described in the Vegetation Restoration Plan, Part 2 (**Attachment C** to this document).

- SFPUC and other land managers in the Bay Area generally prohibit planting of seedlings or saplings in watershed and park lands because of the risk of the spread of *Phytophthora spp.*, a plant pathogen that can be transmitted via seedlings and soil. Although this information was not presented in the FMND, SFPUC has determined, and the California Department of Fish and Wildlife (CDFW) has concurred, that the required restoration must be either in the form of seedlings and saplings that can be verified to be *Phytophthora*-free; or as acorns and other seeds rather than seedlings.
- The FMND assumed that tree replanting would begin immediately after tree removal. However, in part due to the determination that tree replanting could not occur exclusively on the Peninsula Watershed, there has been a lapse of two years since the initial tree removal on the Bunker Hill segment, and a year for the Crystal Spring segment and parts of the Cañada Road segment. The lapse between initial tree removal and initial replanting may extend to a total of three years or more. This will result in an increase in the temporal duration of habitat loss, for which the revised mitigation measure provides increased compensation in the form of off-site oak woodland habitat improvements.

As required by **Mitigation Measure BI-1f -Habitat Protection Measures**, PG&E developed a vegetation restoration plan ("Vegetation Restoration Plan, Part 1") to cover grassland and scrubland replanting on the Peninsula Watershed for all three project segments, and planting of acorns for the Bunker Hill and Crystal Springs segments. This was approved by CDFW and SFPUC in August 2017 (revised April 2018). As noted above, it was subsequently determined that no acorn replanting would be permitting on these segments, for the reasons discussed

³ SFPUC's Water Enterprise Environmental Stewardship Policy adopted on June 27, 2006

above. PG&E is currently implementing grassland and scrub restoration on SFPUC lands. Limited acorn planting also will be permitted within the existing riparian oak woodland footprint along the pipeline alignment in the Cañada Road segment, which are anticipated to accommodate replanting for about 125 trees. As currently estimated, approximately 1,600 additional trees will need to be replanted off-site to meet the established oak woodland mitigation ratios. Should the beginning of off-site replanting be delayed, additional oak woodland restoration could be required, to compensate for the increased duration of habitat loss.

Because the tree restoration could not be completed on the Peninsula Watershed, the San Francisco Planning Department (planning department), the CDFW and PG&E determined that an alternative site for replanting should be identified in eastern San Mateo County. As discussed in the Vegetation Restoration Plan, Part 2 (**Attachment C** to this document, page 9), Wunderlich Park, a San Mateo County Park located 4 to 5 miles south of the Peninsula Watershed, has been identified, in consultation with the San Mateo County Parks Department, as the proposed restoration location.

Because of the changed circumstances and new information described above, amendments of **Mitigation Measure BI-1f, Habitat Protection**, are necessary to ensure that the impacts of habitat loss and of inconsistency with applicable biological resources protection ordinances would still be mitigated to a less-than-significant level.

Accordingly, the project sponsor has been working in consultation with the planning department, the California Department of Fish and Wildlife, SFPUC and the San Mateo County Parks Department to develop a Vegetation Restoration Plan, Part 2, for oak woodland restoration that meets the requirements of **Mitigation Measure BI-1f**, and also is consistent with the tree replanting ratios required by **Mitigation Measure BI-5 (Pre-construction Tree Surveys and Tree Removal)**. As detailed in the restoration plan prepared by PG&E⁴ (**Attachment C** to this addendum) the mitigations would consist of mass removal of eucalyptus trees and other non-native plants in two areas of the park (a total of 16 acres, and replanting of native trees removed at a 3:1 ratio, as required by Mitigation Measure BI-1f), followed by enhancement of natural recolonization in oak woodland species, oak woodland replanting, and

⁴ Final Gas Transmission Pipeline 109 Replacement Projects Vegetation Restoration Plan, Part 2. Prepared by Pacific Gas & Electric Company, Jacobs, and Nomad Ecology. March 2018, revised February 2019. Provided as Attachment C to this document.

adaptive management and monitoring for a seven-year period to ensure that the target stocking rate of 100 oaks and other native trees per acre (a total of 1,600 trees) is met. The restoration plan also includes provisions for replanting and monitoring growth of approximately 125 acorns along the Cañada Road project segment. In addition, PG&E has committed to provide funding for replanting and maintenance of approximately 200 oak trees in the town of Hillsborough, to compensate, under the tree replacement ratios specified by **Mitigation Measure BI-5**, for trees removed during construction of the Crystal Springs segment of the pipeline, along the watershed margins of the town, as discussed in Vegetation Restoration Plan, Part 2 (**Attachment C**).

The Vegetation Restoration Plan, Part 2 would be subject to preparation of a Timber Harvest Plan prepared by the California Department of Forestry (CalFire) per Section 21080.5 of the Public Resources Code and 15251 of the CEQA Guidelines, which would establish environmental requirements and conditions for the tree removal effort. PG&E also would enter into a Memorandum of Agreement with the San Mateo County Parks Department, which is anticipated to include elements such as repairs to park access roads, and public outreach prior to and during implementation of the plan.

The project sponsor proposes to meet the **Mitigation Measure BI-5** requirement for the 1:1 replacement of significant and heritage non-native trees removed from the watershed margins (195 trees), which addresses the project's inconsistency with the County's tree preservation ordinance, by providing funding to the Town of Hillsborough for the cost of replanting of native trees. As detailed in Vegetation Restoration Plan, Part 2 (see **Attachment C** to this document), PG&E and the Town of Hillsborough agreed in January 2019 that PG&E would provide one-time compensation to the Town of Hillsborough to offset the impacts of tree removal during construction of the Crystal Springs segment of the pipeline. PG&E will provide compensation equal to the current market rate for the purchase, installation, irrigation, and maintenance for 202 24-inch-box and 15-gallon-size native California live oak, blue oak and buckeye mature. The proposed text of revised **Mitigation Measure BI-1f** is provided as Attachment B of this document.

Equipment

No changes in equipment type or use from that described in the FMND are proposed.

Schedule

Construction of the Cañada Road segment began in spring 2018. It is anticipated that the duration of construction in this segment, including the proposed revisions, would be five to seven months. The proposed project modifications would not change the construction duration estimated in the FMND. It is anticipated that Sunday construction work would extend throughout the construction period. Acorns were collected during fall 2018 for the restoration effort. Initial acorn replanting is proposed for fall 2018, and eucalyptus removal by spring 2019.

ANALYSIS OF POTENTIAL ENVIRONMENTAL EFFECTS

Section 31.19(c)(1) of the San Francisco Administrative Code states that a modified project must be reevaluated and that, "If, on the basis of such reevaluation, the Environmental Review Officer determines, based on the requirements of the California Environmental Quality Act, that no additional environmental review is necessary, this determination and the reasons therefore shall be noted in writing in the case record, and no further evaluation shall be required by this Chapter." In accordance with CEQA and CEQA Guidelines Section 15126.4(a)(1)(D), this Addendum 2 to the FMND for the PG&E Gas Transmission Line 109 Cañada Road, Bunker Hill, and Crystal Springs Pipeline Replacement Project documents the environmental effects of the proposed changes in construction techniques and schedule for the Cañada Road segment and, at a programmatic level, the potential environmental effects of off-site vegetation restoration under the proposed revisions to biological resources **Mitigation Measure BI-1f: Habitat Protection.**

The FMND found that the project would result in either no impacts, less-than-significant impacts, or impacts that would be less than significant with mitigation. The proposed modifications in construction techniques and schedule, which affect only the Cañada Road segment of the project and would not entail expansion of the work area described in the FMND, increase the volume or area of excavation and other ground-disturbing work associated with construction, or increase anticipated vegetation removal on the project site.

The mitigation measures already applied to the project with respect to cultural and biological resources, prevention of erosion, protection of hydrology and water quality, and riparian restoration would apply to the modified construction elements on City and County of San Francisco land (installation of temporary drainage bridges, increased length of directional drilling, and Sunday use of Sheep Camp Trail) in the same manner as to the project as

approved under the FMND.

Because the plan for oak woodland restoration at Wunderlich Park site would be subject to additional environmental review and approvals, detailed analysis of the potential environmental impacts of implementation of the proposed revised **Mitigation Measure BI-1f: Habitat Protection** (see Attachment B) would be speculative at this time. The revised Mitigation Measure BI-1f provides performance measures, success criteria and schedules that would ensure that the off-site implementation of mitigation measures would be as effective as the mitigation adopted as part of the FMND in reducing the impacts of project construction on sensitive habitats, special status species, land use and aesthetics to less-than-significant levels. Approval of implementation of off-site restoration per **Mitigation Measure BI-1f: Habitat Protection Measures** would be subject to the discretionary action of San Mateo County Parks, the land-owning agency that controls the site. The proposed vegetation management and habitat restoration activities are consistent with the vegetation management program described in San Mateo County Parks' Huddart and Wunderlich Master Plan⁵, and analyzed in the EIR for that project.⁶

In addition, timber removal and reforestation at Wunderlich County Park would require preparation of a Timber Harvest Plan, under California Forest Practice Rules,⁷ which would be subject to approval by the California Department of Forestry (CalFire), the CEQA lead agency for the restoration at Wunderlich. Consistent with those rules, potential environmental impacts for timber harvest and reforestation under Vegetation Restoration Plan, Part 2 would be addressed by conditions that would be set forth in the Wunderlich Timber Harvest Plan (which is currently in preparation).

As discussed below under analyses for each resource topic, it therefore is not anticipated that

⁵ Huddart and Wunderlich Parks Master Plan. County of San Mateo Environmental Services Agency Parks and Recreation Division, May 2006.
https://parks.smcgov.org/sites/parks.smcgov.org/files/documents/files/Huddart%20and%20Wunderlich%20Master%20Plan_0.pdf

⁶ Huddart and Wunderlich Parks Master Plan Environmental Impact Report, prepared by San Mateo County Parks Department by ESA; Draft 2007, Final 2008.
https://parks.smcgov.org/sites/parks.smcgov.org/files/documents/files/Huddart%20and%20Wunderlich%20Master%20Plan%20-%20Environmental%20Impact%20Report_0.pdf

⁷ Forest Practice Rules, 2017. Title 14, California Code of Regulations, Chapters 4, 4.5 and 10 with the Z'Berg-Nejedly Forest Practice Act; Pertinent Excerpts from Protection of Forest, Range and Forage Lands- Prohibited Activities and the Wild and Scenic Rivers Act; the Professional Foresters Law and Registration of Professional Foresters Rules and with information related to Forest Roadbed Materials

implementation of proposed revised **Mitigation Measure BI-1f: Habitat Protection** at Wunderlich Park, under Vegetation Restoration Plan, Part 2, would result in new significant impacts or increase the severity of impacts previously-identified in the MND. It is anticipated that the proposed revisions to **Mitigation Measure BI-1f** would be equally as effective as the original mitigation measures in reducing the potentially significant effects of the project to oak woodland habitat and with respect to inconsistency with local tree preservation ordinances to less-than-significant levels. The modified project therefore would have similar effects as the original project, as analyzed below.

As described further in the following paragraphs, the modified project therefore would not result in new or different environmental impacts, substantially increase the severity of the previously identified environmental impacts, or require new mitigation measures, and no new information has emerged that would materially change the analyses or conclusions set forth in the FMND. Therefore, the modified project would not substantially change the analyses or conclusions in the FMND. The following discussion provides the bases for this conclusion.

Aesthetics

FMND Analysis

As analyzed in the FMND, the proposed project included trimming or removal of a total of 5.8 acres of oak woodland, linearly distributed along the project alignment. The FMND concluded that aesthetic impacts from construction would be less than significant because the work in each segment would last only a few months and the affected areas would be restored to existing conditions at the conclusion of construction. The FMND also concluded that the aesthetic effects of tree removal would be less than significant because most publicly-accessible views would remain relatively unchanged and because the project includes a vegetation restoration plan that includes replanting of both low-growing vegetation and of trees. The FMND therefore concluded that the proposed project would not substantially or permanently degrade the visual quality of the project area for the public, and long-term impacts were deemed to be less than significant. The FMND also concluded that implementation FMND **Mitigation Measure BI-1f: Habitat Protection Measures** and **Mitigation Measure BI-5: Pre-construction Tree Surveys and Tree Removal** would further reduce the already less-than-significant aesthetic impact.

Effects of Proposed Project Modifications

The proposed reduction in the length of trenching would reduce the number of trees to be

removed by two. This is a minor change relative to the several hundred trees to be removed along the Cañada Road segment of the pipeline, and any change in the aesthetic effect would be negligible. Vegetation removal and excavation for installation of temporary bridges was considered in the FMND, even though the bridges were not explicitly described; thus the aesthetic effects of the project modifications would not differ from those described in the FMND. A change in construction schedule and the use of Sheep Camp Trail for construction access on Sundays would have no aesthetic effects, since use of this trail for construction access was already anticipated and the effect was assessed as less than significant.

Due to the changed circumstances described above, only very limited tree replanting can be implemented on the construction sites. Under the proposed revisions to **Mitigation Measure BI-1f: Habitat Protection Measures** oak woodland restoration and other tree replanting would primarily be implemented offsite at Wunderlich County Park, as discussed above. As indicated in the FMND, the aesthetic impact of tree removals would be less than significant without mitigation, although the vegetation restoration mitigation measures would further reduce this impact. The **Mitigation Measure BI-5: Pre-construction Tree Surveys and Tree Removal** requirement to replace significant and heritage non-native trees would be met and exceeded by PG&E's proposed in-lieu payment to the Town of Hillsborough for planting of oaks to compensate for primarily non-native trees removed from the Hillsborough margins of watershed lands. As SFPUC policy prohibits tree encroachments in the watershed, Hillsborough's tree replanting would be undertaken elsewhere in the town rather than along the margins of SFPUC watershed lands/watershed leases (such as the Crystal Springs Golf Course). Implementation of the revised mitigation measure would not alter the less-than-significant impact identified previously. Oak replanting within Hillsborough would increase the inventory of oaks in the Town of Hillsborough, a beneficial aesthetic effect. Elsewhere along the alignment, the aesthetic effect of the removal of trees would be less than significant because most segments of the linear alignment from which trees were removed is not highly visible from publicly-accessible viewpoints.

Effects of Off-Site Restoration

Oak woodland restoration at Wunderlich County Park, under the revised mitigation measure revisions, would include removal of invasive/non-native trees followed by passive and active restoration of the restoration areas for conversion to/ enhancement as oak woodland. Eucalyptus clearing would alter the visual setting of the restoration sites from hiking/ riding trails that pass by the sites, particularly during the period between removal of existing invasive

trees and colonization and maturation of oak woodland on each site. Removal of the eucalyptus forest thus could temporarily reduce the aesthetic enjoyment of park users of adjacent trails. However, the long-term effect of the restoration would be to restore the area to oak woodland. Aesthetic impacts would temporarily impact the restoration sites; however, once the restoration is in effect the aesthetic impacts would be lessened. On this basis, the aesthetic effects of off-site restoration would be less than significant.

Cultural Resources

FMND Analysis

The FMND found that the project would have no impact on historic built-environment resources. The FMND further found that no known archeological resources are located within the Area of Potential Effects for the Cañada Road project segment of the project and concluded that the project would result in less-than-significant impacts with mitigation incorporated on archaeological resources, human remains, and tribal cultural resources.

Effects of Proposed Project Modifications

The project's potential to affect archaeological resources in the Peninsula Watershed was fully assessed in the FMND. The proposed project modifications would slightly reduce the amount of anticipated ground disturbance on the construction sites. The potential for significant effects on undiscovered archaeological resources, human remains, and tribal resources on the Peninsula Watershed would be essentially the same as under the original project and would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-CR-2: Archaeological Monitoring, Mitigation Measure M-CR-3: Unanticipated Discoveries of Human Remains, and Mitigation Measure CR-4: Tribal Cultural Resources Interpretative Program**. Consistent with Mitigation Measure M-CR-2, an Archaeological Monitoring Plan for the Cañada Road segment was prepared in May 2018 to reflect the proposed revisions to the project,⁸ and will be implemented throughout construction.

Effects of Off-Site Restoration

No significant archaeological resources were discovered during archaeological survey of the Wunderlich restoration parcels.⁹ Therefore, no effect to archaeological resources would be

⁸ PG&E Line 109 Archaeological Survey Report Addendum, Cañada Road Segment, Far Western Anthropological Research Group. May 2018. Confidential archaeological report submitted to San Francisco Planning Department, Environmental Planning archaeologist.

⁹ Cultural Resources Survey Letter Report for PG&E's Line 109 Wunderlich County Park Timber

anticipated. Historical resources within the Wunderlich County Park include the Folger Estate Stable National Register Historic District Portions of a road through the historic district would be used for restoration access. The road segments providing immediate access to the historic district buildings were assessed as contributing elements of the historic district, with significance based on historic alignment, rather than on the physical characteristics of the roads.¹⁰ Although the restoration could include upgrades to some parks roads to facilitate logging access and future access for fire control, no modifications would be made to the portions of the road that are within the historic district, which are currently used for general access and are well-maintained. The envisioned road improvements are also consistent with San Mateo County's approved master plan for Wunderlich.¹¹ Neither proposed restoration site is visible, or located within the historic district, so there would be no anticipated potential effect to the historic setting.

Air Quality

FMND Analysis

The FMND found that the project's construction air quality impacts from fugitive dust and criteria air pollutants would be less than significant with implementation of **Mitigation Measures M-AQ-1a: Dust Control** and **M-AQ-1b: Construction Emissions Minimization Plan**.

The FMND also evaluated the potential for health risk impacts based on the exposure to project-generated criteria air pollutants of sensitive receptors that are within approximately 1,000 feet from an emission source. No sensitive receptors were identified within 1,000 feet of the Cañada Road segment. Therefore, the FMND concluded that construction activities along the Cañada Road segment would not result in substantial health risks to sensitive receptors.

Effects of Proposed Project Modifications

The proposed project changes are anticipated to have no net effect on the pipeline construction schedule or use of heavy equipment on the Peninsula Watershed. Impacts of pipeline

Harvest Plan, Woodside, San Mateo County, California, Naomi Sher, Far Western Anthropological Research Group, November 20, 2018. On file San Francisco Planning Department, Case No. 2013.1761E

¹⁰ Folger Estate Stable National Register Historic District National Register of Historic Places Registration Form. National Park Service, 2004. Accessed online, 12/11/2018, <https://npgallery.nps.gov/AssetDetail/NRIS/04000328>

¹¹ Huddart and Wunderlich Parks Master Plan. County of San Mateo Environmental Services Agency Parks and Recreation Division, May 2006, pp 2-18 to 2-19.

construction with respect to fugitive dust and air emissions would remain the same as under the original project and would be reduced to a less-than-significant level with implementation of FMND **Mitigation Measure M-AQ-1a: Dust Control** and **M-AQ-1b: Construction Emissions Minimization Plan**.

Effects of Off-Site Restoration

The proposed tree removal at the off-site restoration site(s) sites under the proposed modification to **Mitigation Measures BI-1f: Habitat Protection Measures** are anticipated to entail logging, long-term invasive vegetation control and staged replanting at the envisioned revegetation site(s). The tree removal effort would require up to four weeks of additional heavy equipment work. This would increase the total duration of project activities that would produce diesel emissions and that could generate airborne dust.

The closest residence to the proposed logging and restoration sites at Wunderlich County Park is well over 1,000 feet east and north of the restoration sites. No residences therefore would be expected to be exposed to criteria pollutant emissions or fugitive dust from the logging effort. The proposed logging also would be separated in time by at least six months from the Cañada Road pipeline construction, and the pipeline construction site is more than four miles distant from Wunderlich Park. Further, the Wunderlich Timber Harvest Plan (THP; in preparation) for logging associated with off-site implementation of the vegetation restoration plan will require that the project meet regional air quality regulations and California Department of Forestry Forest Practice Rules.¹² Under these rules, the THP would include emissions minimization measures for tree removal, dust control and heavy equipment operations. For these reasons, restoration work, including tree removal, would not be anticipated to result in significant air quality impacts or increase the severity of the impacts identified in the FMND. No new or more substantially more significant air quality emissions or health risk impacts than were identified in the FMND are anticipated, and the air quality impact would be less than significant.

https://parks.smcgov.org/sites/parks.smcgov.org/files/documents/files/Huddart%20and%20Wunderlich%20Master%20Plan_0.pdf

¹² Forest Practice Rules, 2017. Title 14, California Code of Regulations, Chapters 4, 4.5 and 10 with the Z'Berg-Nejedly Forest Practice Act; Pertinent Excerpts from Protection of Forest, Range and Forage Lands- Prohibited Activities and the Wild and Scenic Rivers Act; the Professional Foresters Law and Registration of Professional Foresters Rules and with information related to Forest Roadbed Materials

Biological Resources

FMND Analysis

The proposed project (including all three locations) would result in the removal of a total of approximately 5.5 acres of oak woodland, including removal of approximately 850 trees. The FMND found that the project would not conflict with an adopted habitat conservation plan and would have a less-than-significant impact on wildlife movement. The project also would have less-than-significant impacts, with mitigation incorporated, on sensitive species, sensitive natural communities, wetlands, and state and local policies regarding tree preservation and protection of oak woodlands.

The FMND identified several biological resources mitigation measures for the protection of special status plants and animals, and for restoration or replacement of habitat temporarily or permanently lost through removal of trees and other vegetation and concluded that these measures would reduce the impacts of the project to less-than-significant levels.

Effects of the Proposed Project Modifications

The proposed project modifications would slightly reduce the footprint of construction work and would reduce by two the number of trees to be removed on the Peninsula Watershed. Under the project modification, it is presently envisioned that oak woodland restoration under Vegetation Restoration Plan, Part 2 would be implemented at Wunderlich County Park.

Wildlife

The PG&E Line 109 project workspace is considered to be critical habitat for California Red Legged Frog and includes aquatic foraging and breeding habitats for San Francisco Garter Snake. There also is the potential for San Francisco Dusky-Footed Woodrat, nesting birds and roosting bats to be present on the Peninsula Watershed Cañada Road project site. Because the project would not increase the footprint of on-site construction work, and in fact would reduce the number of trees to be removed by two, the proposed minor project modifications on site (temporary bridges, additional use of directional drilling and Sunday use of Sheep Camp trail for construction) would not be expected to alter the previously identified potential for effects to wildlife.

The modified project would result in similar impacts on the same 14 special-status species listed in the FMND as the proposed project, because the work area would not differ

substantially (and would be slightly reduced) relative to the project area analyzed in the FMND and Addendum 1. These would be reduced to a less-than-significant level with implementation of the species-specific mitigation measures **M-BI-1a: San Francisco Garter Snake and California Red-Legged Frog Protection Measures; M-BI-1b: Bat Roost Surveys and Avoidance and Minimization Measures; M-BI-1c: Pre-construction Bird Surveys; M-BI-1d: San Francisco Dusky-footed Woodrat; M-BI-1e: Fragrant Fritillary Protection Measures; M-BI-1f: Habitat Protection Measures; M-BI-3: Protection Measures for Jurisdictional Water Bodies and Riparian Areas; and M-BI-5: Pre-construction Tree Surveys and Tree Removal**, which are included in the project.

Habitat and Tree Removal

As detailed in the project description above (p. 7), the number of trees to be removed from the project footprint under the project modification would be reduced by two, relative to the proposed project. There would be no change in effects to other habitat types on the Cañada Road construction site.

As discussed above, the project sponsor has developed Vegetation Restoration Plan, Part 2 (provided as **Attachment C** to this addendum) for off-site restoration on 16 acres of former oak woodland at Wunderlich. The plan proposes removal of eucalyptuses and other non-native plants on the restoration sites, monitoring and enhancement of “passive restoration” of oak woodland, and active replanting and irrigation of acorns and seeds of other native trees as needed to achieve the mitigation measure’s tree restoration requirements; that is, restoration of approximately 1,600 oak woodland trees. The vegetation restoration plan also specifies a timeline for implementing the restoration project, success criteria, and monitoring/ reporting guidelines. In addition, under the revised mitigation measure the project sponsor would be responsible for restoration of an increased number of trees and acreage of oak woodland, should any future delays occur in the initiation of tree restoration. PG&E has committed to funding the restoration and to working collaboratively with the San Francisco Planning Department, CDFW, the County of San Mateo Parks Department, SFPUC, or other partners as necessary, to mitigate for tree impacts associated with the Line 109 project to comply with the requirements of the FMND and **Mitigation Measure B1-5: Pre-construction Tree Surveys and Tree Removal and M-BI-1f: Habitat Protection Measures**.¹³ It is envisioned that PG&E’s

¹³ *Mitigation Assurances – San Mateo County L109 Tree Impacts*. Memo from Matthew Brown, PG&E, to Serge Glushkoff, CDFW, March 30, 2018. On file San Francisco Planning Department, Case No. 2013.1761E

implementation of the restoration program would begin immediately upon approval by the partner agencies, subject to CalFire approval of a Timber Harvest Plan (in preparation) for the off-site location. Details regarding requirements for the Vegetation Restoration Plan, Part 2, are set forth in revised **Mitigation Measure BI-1f**, which is provided in **Attachment B** to this document. The Vegetation Restoration Plan, Part II is provided as **Attachment C**.

The revised mitigation measure also includes provisions to address the potential uncertainty of the efficacy of the proposed off-site restoration. If implementation of the off-site restoration to the extent currently envisioned were determined to be infeasible, such that PG&E's full restoration obligation could not be attained at the identified site(s), PG&E would be required to develop another option(s) for restoration within eastern San Mateo County to meet the full obligation of the mitigation measure within six months. Secondly, if after good-faith efforts by PG&E, CDFW determines that the envisioned restoration is infeasible in eastern San Mateo County, PG&E may alternatively compensate for impacts on oak woodlands in whole or in part through a contribution to the Oak Woodlands Conservation Fund as established under subdivision (a) of Section 1363 of the Fish and Game Code; or by purchase of high quality oak woodland and establishment of a conservation easement, and donation of this land to the San Mateo County parks or other oak woodland land manager in San Mateo County. The portions of **Mitigation Measure BI-1f: Habitat Protection Measures** that are pertinent to oak woodland restoration have been amended to include the changed conditions and stipulations discussed above.

Mitigation Measure BI-5: Pre-construction Tree Surveys and Tree Removal, which addresses the inconsistency of the tree removal carried out by the project with the State and local tree protection ordinances, would be implemented through planting of native trees in the Town of Hillsborough, as described above. Implementing **Mitigation Measure BI-5** in this manner would provide compensation for removal of significant and heritage non-native and native trees that were located along the watershed margins adjacent to private properties, and would benefit native serpentine grassland habitat on the Peninsula Watershed by removing and not reintroducing tree encroachment on native grassland habitat.

The text of the modified measure, with eliminated text indicated with strike outs (~~strike-out~~) and additions indicated by double underlines, is provided as **Attachment B** (Modified Mitigation Measure) to this addendum. The unmodified portions of mitigation measures BI-1f are applicable to the modified project in the same manner as provided in the original

mitigation measure. The Mitigation Monitoring and Reporting Program for the project, modified as amended by the proposed modifications to Mitigation Measure BI-1f, is provided as **Attachment D** to this document.

Implementation of revised **Mitigation Measure BI-1f: Habitat Protection Measures**, in conjunction with implementation of **Mitigation Measure BI-5: Pre-construction Tree Surveys and Tree Removal** would reduce the project's impact on oak woodland habitat and of inconsistency with local tree preservation ordinances in San Mateo County to a less-than-significant level, in a manner equally as effective as the original FMND mitigation measures.

Effects of Off-Site Restoration

Under revised **Mitigation Measures BI-1f**, 16 acres of non-native eucalyptus and acacia trees would be removed at Wunderlich Park for passive and active restoration as oak woodland. The project sponsor's biologist conducted biological resource surveys of the restoration sites.¹⁴ No rare, threatened or endangered ("T&E") species have been observed in the project area, and San Mateo County Parks has not observed or documented T&E species mapped in this area. Although the area is not expected to support any rare plants, given that the project area is a thick overstory of eucalyptus and non-native acacia, PG&E would conduct surveys for rare plants during the appropriate blooming period in spring 2019 and would avoid and protect any species discovered. Nearby tributary creek channels do not support anadromous fish species due to a complete fish barrier downstream.

Consistent with the requirements of the Huddart and Wunderlich Parks Master Plan EIR¹⁵, which concluded that fuel reduction of eucalyptus would have no significant impact on biological resources and, consistent with Forest Practices Act requirements for Timber Harvest Plans, wildlife and blooming season special status plant surveys of the affected areas would be conducted prior to the beginning of restoration, and special status plants and wildlife, if identified in the work area, would be protected through avoidance measures. In addition, a biological monitor will conduct a nesting season survey, and will be present during all vegetation clearing activities to ensure that impacts to nesting birds and bats are avoided. With

¹⁴ Personal communication from Christina Ellsworth, PG&E, to Sally Morgan, San Francisco Planning Department, November 6, 2018.

¹⁵ Huddart and Wunderlich Parks Master Plan Environmental Impact Report, prepared by San Mateo County Parks Department by ESA; Draft 2007, Final 2008.
https://parks.smcgov.org/sites/parks.smcgov.org/files/documents/files/Huddart%20and%20Wunderlich%20Master%20Plan%20-%20Environmental%20Impact%20Report_0.pdf

implementation of the avoidance and minimization measures required under the Forest Practices Act, the project is not expected to have any impact on plant, wildlife, or anadromous fish resources. PG&E will submit the completed biological report to CalFire with the Timber Harvest Plan (THP), and the THP will provide any necessary project environmental review under CEQA. The impacts of the off-site restoration on biological resources are therefore anticipated to be less than significant.

Geology and Soils

FMND Analysis and Effects of Proposed Project Modifications

The FMND found that the project would have less-than-significant impacts related to exposure of people and structures to strong seismic ground shaking, liquefaction and landslides, soil erosion, and changes to topography and geologic units, and less-than-significant impacts with mitigation related to unstable geologic units, expansive soils, and paleontological resources. The modified project would extend the length of HDD construction, and add construction of temporary bridges at several stream crossings, but these actions would not expand the work areas analyzed in the FMND or introduce any new construction techniques. No additional permanent structures are proposed. Therefore, the project modifications would not result in new or more severe geological resources impacts on the Peninsula Watershed than the project analyzed in the FMND.

Effects of Off-Site Restoration

The off-site implementation of modified mitigation measures BI-1f, under the revised project, would entail removal of numerous eucalyptus trees and other invasive plant species at Wunderlich County Park. Heavy equipment work and vegetation removal on steep slopes has the potential to destabilize soils and potentially result in landslides. However, the logging operation at Wunderlich, and subsequent slope protection during restoration, will be subject to a Timber Harvest Plan, which will include slope protection requirements consistent with the California Forest Practice Act. Standard provisions of such plans include assessment of slope stability and the required inclusion of slope stabilization measures and post-logging controls to ensure against landslides and erosion. The modified project would not entail any excavation off site, and therefore would not have the potential to affect paleontological resources at Wunderlich. It therefore can be anticipated that implementation of off-site mitigation at Wunderlich Park, under the revised project, would not result in new geology and soils impacts or increase the severity of impacts previously identified; the impacts therefore would remain less than significant.

Hydrology and Water Quality

FMND Analysis

The FMND found that the project would have less-than-significant impacts related to groundwater depletion and stormwater drainage, and that all other potential impacts on hydrology and water quality would be less than significant with mitigation incorporated.

As analyzed in the FMND, vegetation removal in the temporary construction areas along the streams would disturb soils and could accelerate soil erosion rates and downstream sedimentation, causing potentially significant adverse impacts on surface water quality. The FMND determined that these temporary impacts would be mitigated to a less-than-significant level through implementation of the project's required Stormwater Pollution and Prevention Plan (SWPPP), along with implementation of **Mitigation Measure M-BI-1f, Habitat Protection Measures**, which requires development and implementation of a Vegetation Restoration Plan, and **Mitigation Measure M-BI-3, Protection Measures for Jurisdictional Water Bodies and Riparian Areas**, which provides protection measures for water bodies and riparian areas. The project-specific SWPPP would include an erosion control and grading plan, which describes backfilling, returning to original grade, and re-establishing a vegetative cover in previously vegetated areas or implementing other equivalent stabilization measures. The vegetation restoration plan would also discuss re-establishing vegetative cover after construction and at the envisioned restoration site(s).

Effects of the Proposed Project Modifications

The addition of temporary bridges across several drainages would not substantially change the nature of proposed work or of potential impacts to hydrology or water quality at trenched drainages. These actions are consistent with the project activities overall and with construction methods analyzed for the original project in the FMND, and impacts would be addressed by the hydrology and water quality mitigation measures identified above. It therefore is not anticipated that the minor project revisions would result in new or more severe impacts than the original project with respect to water quality, erosion, flooding, seiche, tsunami, or mudflow, and the impacts would remain less than significant with mitigation.

Effects of Off-Site Restoration

The proposed off-site restoration sites at Wunderlich Park do not contain any stream courses, are not adjacent to streams, creeks, or other waterways, and are accessible via existing roads. Tree removal at Wunderlich would be subject to erosion control and stormwater runoff

provisions as conditions of approval of the Timber Harvest Plan, consistent with the requirements of the Forest Practice Act. Because of the environmental controls that would be required as conditions of approval of the THP, implementation of off-site mitigation therefore would not be expected to result in new or more severe impacts not identified in the FMND, and the impact would remain less than significant.

Hazards and Hazardous Materials

FMND Analysis and Effects of the Proposed Project Modifications

The FMND found that the project would have no impact on implementation of emergency response plans, less-than-significant impact related to transport of hazardous materials, and less-than-significant impacts with mitigation related to release of hazardous materials and exposure to fires. Construction of the modified project would involve the same potential for small accidental releases of hazardous materials (i.e. fuel, oil, and lubricant) as the original project, and these impacts would be mitigated to a less-than-significant level through implementation of **Mitigation Measure M-HZ-2: Treatment of Unanticipated Hazardous Materials**. The project is located within a State Response Area ranging in designation from moderate to very high fire hazard severity. PG&E would clear trees and shrubs within 10 feet on either side of the alignment (which would be reduced relative to the originally analyzed work area), as described under **Mitigation Measure M-HZ-6: Fire Avoidance and Suppression**, and would follow the guidance provided by the measure, to reduce impacts related to fire exposure to a less-than-significant level. The proposed project modifications therefore would include the same mitigation measures as the proposed project and would have the same less-than-significant impacts at the construction site as identified for the proposed project.

Effects of Off-Site Restoration

Implementation of Vegetation Restoration Plan, Part 2, would entail removal of eucalyptus forest at Wunderlich County Park. Tree removal and woodland restoration at Wunderlich under the proposed revisions to **Mitigation Measure BI-1f: Habitat Protection** would be subject to controls on the use of hazardous materials similar to those identified in the FMND, as conditions of approval of the Timber Harvest Plan and consistent with the requirements of the Forest Practice Act. For this reason, implementation of off-site mitigation therefore would not be expected to result in new or more severe impacts associated with the use and storage of hazardous materials than the project as analyzed in the FMND, and the impact would remain less than significant.

With respect to other hazards, because eucalyptus trees pose a greater risk of wildland fire than oak woodland, the removal of eucalyptus forest under the revised measures could provide a beneficial effect with respect to risk from wildfires for the adjoining community. In addition, implementation of the Timber Harvest Plan would include road improvements at Wunderlich Park that would facilitate emergency access and egress. The proposed project revisions therefore would have a beneficial effect with respect to the risk of wildland fires and emergency response.

The hazards and hazardous materials impacts of off-site restoration, like those of the project as analyzed in the FMND, therefore would be expected to be less than significant.

Recreation

MND Analysis and Effects of the Proposed Project Modifications

The FMND concluded that the impact of the project on recreational users and facilities would be less than significant. Under the modified project, construction activity in the Cañada Road segment would take place on Sundays. Cañada Road is closed to motor vehicles on Sundays and receives heavy recreational use on that day by bicyclists and pedestrians. To avoid conflicts between recreational and construction traffic, construction access under the modified project would be prohibited from using Cañada Road on Sundays. Instead, the construction alignment would be accessed from via Interstate 280 and Sheep Camp Trail, a paved/ graveled road. The original project included the closure of Sheep Camp Trail for the duration of construction for safety reasons. The duration of this closure would not be extended under the modified project. Further, while construction work could potentially be visible from Cañada Road to recreational pedestrians and bicyclists on Sundays for up to 10 weeks, the work that would take place on Sundays would be at sufficient distance from the road not to be obtrusive upon the recreational experience.

Effects of Off-Site Restoration

Tree removal associated with the off-site implementation of Vegetation Restoration Plan Part 2 at Wunderlich County Park also would have the potential to affect recreational experience. The proposed restoration areas are adjacent to public hiking and horse riding trails. It could be anticipated that these would need to be closed for public safety during active logging. However, these activities are anticipated to be limited to about four weeks duration. The impact to recreational use therefore would be short term and temporary. The aesthetic

experience of park users on the adjacent trails would be changed by the eucalyptus removal, particularly during the period between removal of the eucalyptuses and regrowth of oak woodland. For the reasons discussed under “Aesthetics”, above, this impact would be less than significant.

Other Environmental Topics

As compared to the original project, the modified project would represent no change in the project’s **less-than-significant impacts** related to land use, population and housing, transportation and circulation, greenhouse gas emissions, wind and shadow, utilities and service systems, public services, mineral/energy resources, and agricultural and forest resources.

The FMND noted **less-than-significant impacts with mitigation incorporated** on land use and noise. The modified project does not involve changes to the portion of the original project that resulted in identification of noise or land use impacts. At the construction site, the modified project would neither increase the severity of the impacts associated with the project or result in new or substantially different environmental effects. Heavy equipment use for tree removal as part of implementation of Vegetation Restoration Plan, Part 2 would generate noise in Wunderlich County Park. However, it is anticipated that tree removal would be completed within a period of four weeks. Thus, any noise impacts would be short term and temporary.

SUMMARY AND CONCLUSIONS

The FMND mitigation measures applicable to the Peninsula Watershed would be implemented prior to or during construction to mitigate potential significant impacts. The significance conclusions reached in the FMND would not change based on the project modifications, and all applicable mitigation measures from the FMND would be applied to the modified project. Modifications to previously-adopted **Mitigation Measure BI-1f** (see **Attachment B**) have been included in the modified project to address changed circumstances with respect to tree replanting. With these modifications, the mitigation measure would be equally as effective as the original measure in mitigating the potential impacts of tree removal upon sensitive habitats to a less-than-significant level. Implementation of Vegetation Restoration Plan, Part 2 at Wunderlich County Park (**Attachment C** to this document), consistent with the proposed revisions to mitigation measures BI-1f and BI-5, is not anticipated to result in new or more significant impacts. It is anticipated that any potential impacts would be identified in the

Timber Harvest Plan for the project, which will be prepared for CalFire review and approval, and that CalFire would impose conditions on the THP approval, consistent with the Forest Practices Act, which would reduce any identified impacts to less-than-significant levels. The FMND Mitigation Monitoring and Reporting Program, which provides the full text of the mitigation measures cited above, is provided as Attachment D to this document.

Based on the foregoing information, it is concluded that the proposed revisions to the project would not cause new significant impacts not identified in the FMND or increase the severity of any impact previously identified in the FMND and that no new mitigation measures would be necessary to reduce significant impacts. No changes have occurred with respect to circumstances surrounding the proposed project that would cause significant environmental impacts to which the project would make a considerable contribution, and no new information has become available that shows that the project would cause significant environmental impacts that cannot be mitigated to less-than-significant levels. Therefore, no supplemental environmental review is required beyond this addendum.

I do hereby certify that the above determination has been made pursuant to State and Local Requirements.

Date of Determination:

February 21, 2019

I do hereby certify that the above determination has been made pursuant to State and Local requirements.

Lisa Gibson

Lisa Gibson
Environmental Review Officer

cc: Christina Ellsworth, Project Sponsor
Distribution List
Virna Byrd, Master Decision File/Bulletin Board

Attachment A. Figures

Attachment B. Mitigation Measure BI-1f Modification

Attachment C. Gas Transmission Pipeline 109 Replacement Project, Vegetation Restoration Plan, Part 2. Pacific Gas & Electric and Nomad Ecology, February 2019.

Attachment D. FMND Mitigation Monitoring and Reporting Program

**PG&E Gas Transmission Line 109 Cañada Road, Bunker Hill and Crystal Springs Pipeline
Replacement Project San Mateo County
Final Mitigated Negative Declaration, Addendum 2**

Attachment A. Figures

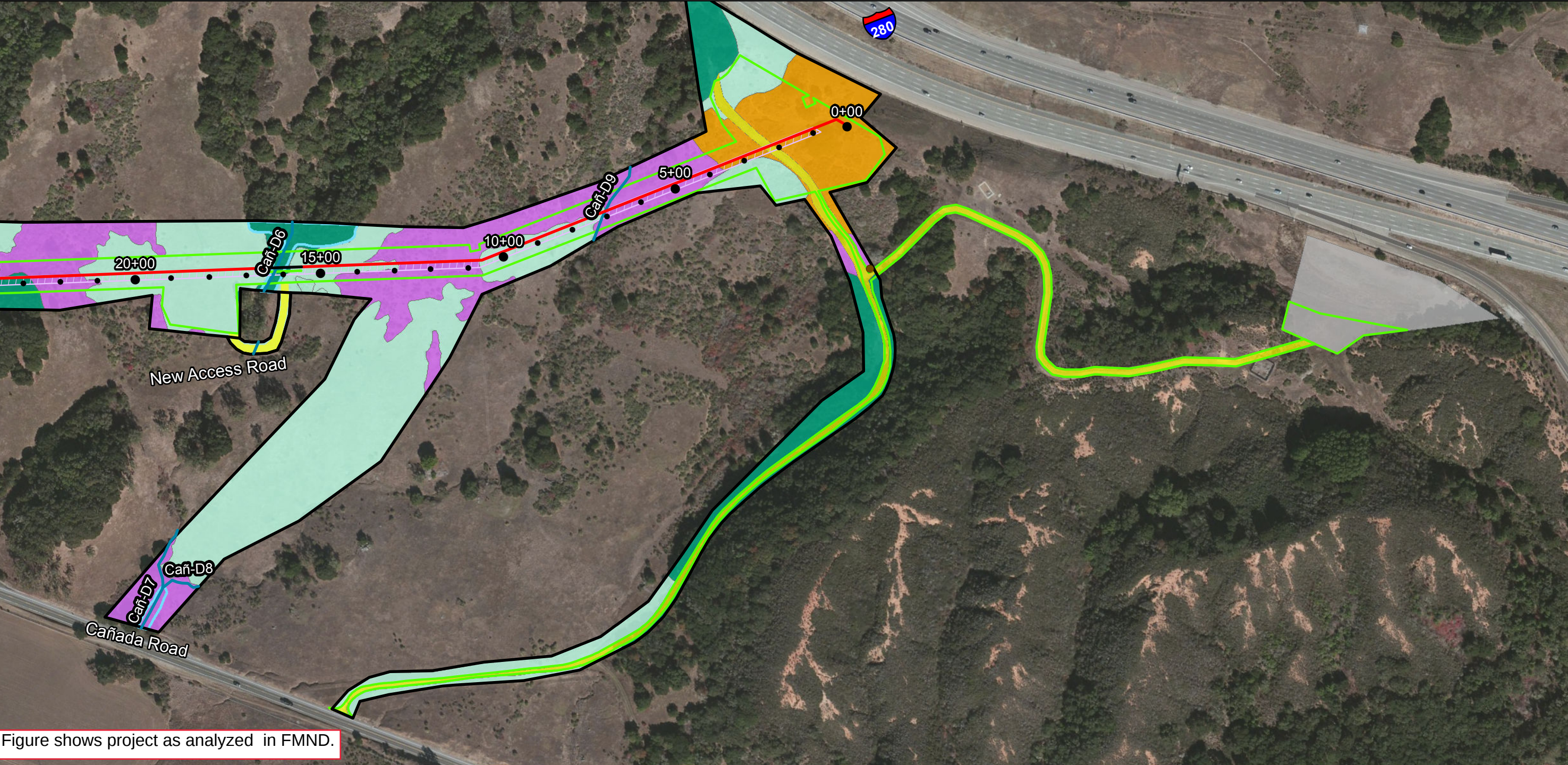
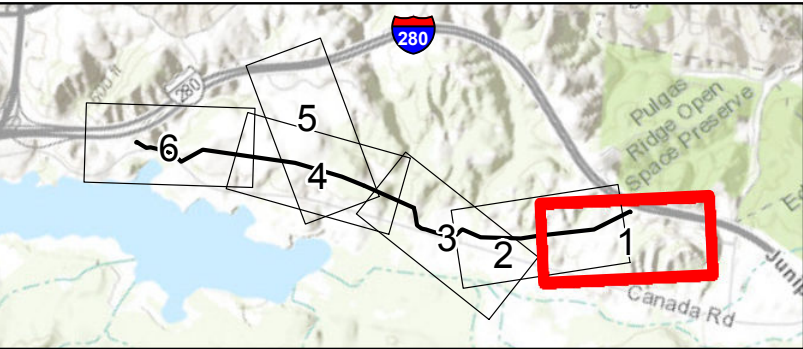


Figure shows project as analyzed in FMND.



Legend

- Line 109 Cañada Road Pipeline Replacement
- Aerially Spanned Pipeline Replacement
- HDD Pipeline Replacement
- Stationing
- Construction Work Area
- Proposed Permanent Easement

Access Roads

- Access Roads

Project Survey Area

- Project Survey Area

Wetland Features

- Ephemeral Stream
- Non-jurisdictional Cement-lined V-ditch
- Riparian

Vegetation Communities

- Coast live oak woodland
- Coastal sage scrub
- Coyote bush scrub
- Needlegrass Grassland
- Disturbed

Special Status Plants

- Franciscan onion (Allium peninsulare var. franciscanum)
- Bent-flowered fiddleneck (Amsinckia lunaris)

Special Status Plants

- Bush Mallow (Malacothamnus Hallii)
- Choris' popcornflower (Plagiobothrys chorisianus var. chorisianus)
- San Francisco blue eyed mary (Collinsia multicolor)

Proposed changes: Install temporary bridge at D9 for construction access; use drainage flume rather than coffer dam for construction water diversion in D9

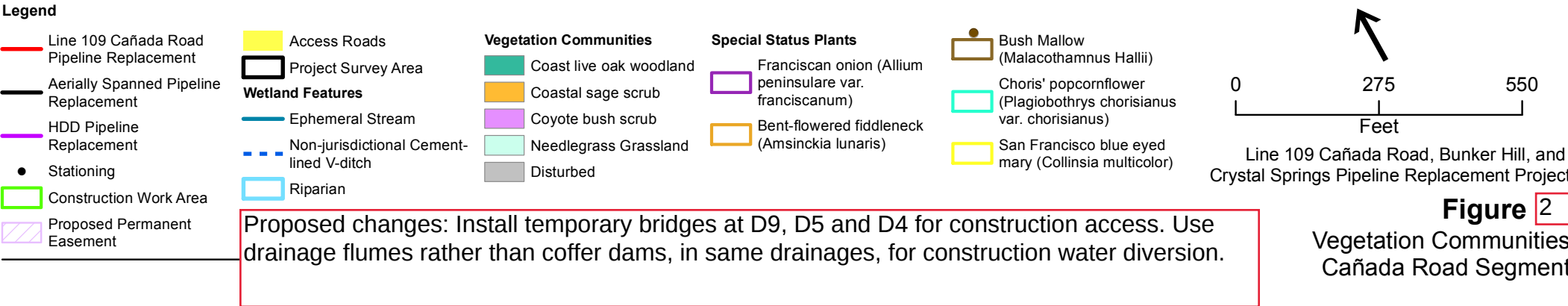
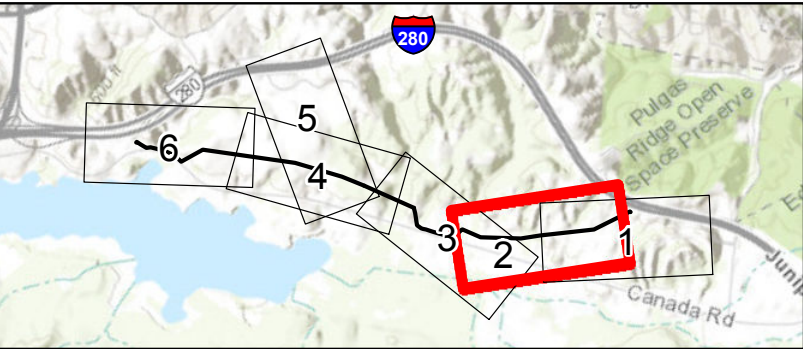
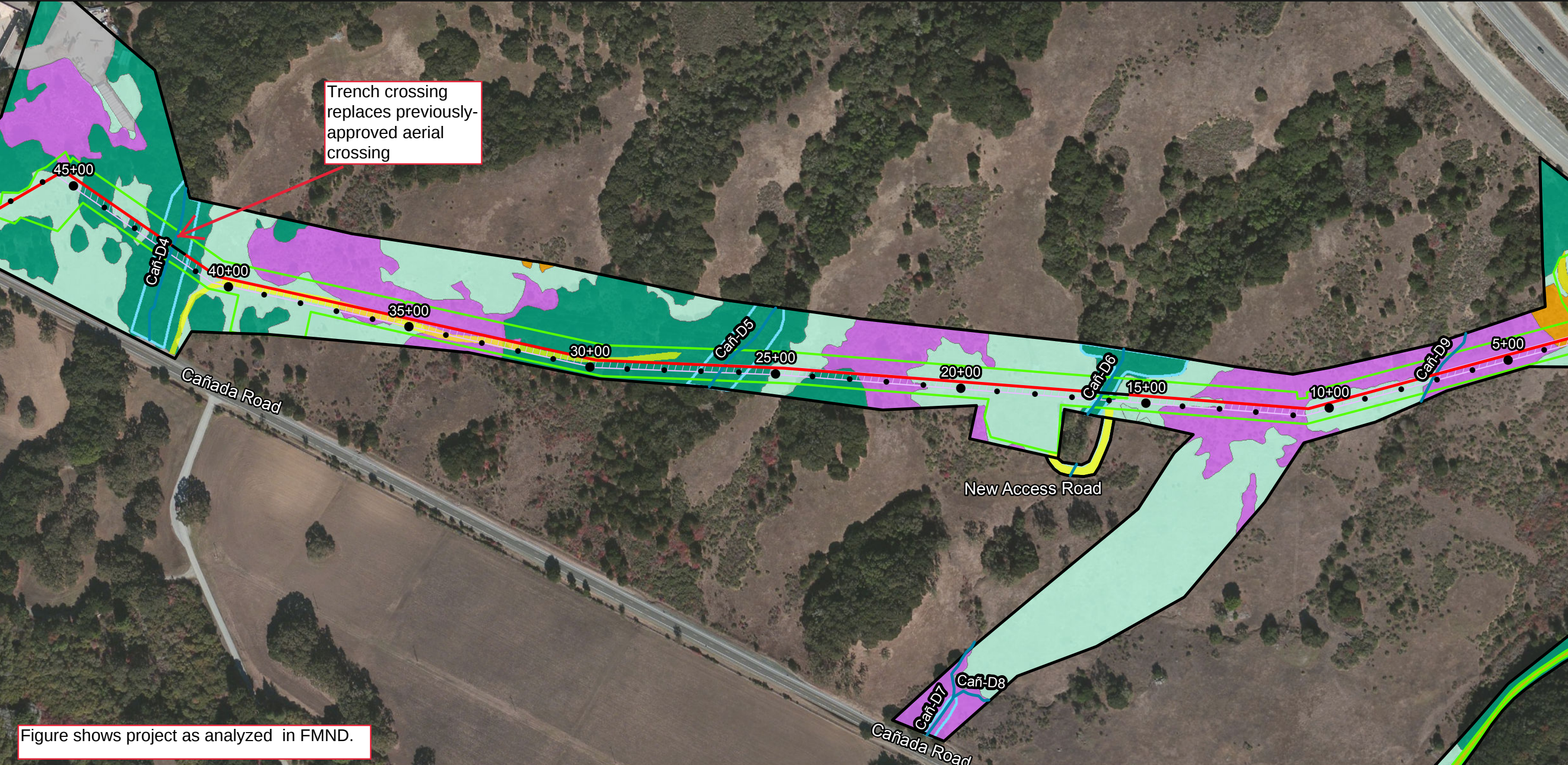
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Line 109 Cañada Road, Bunker Hill, and Crystal Springs Pipeline Replacement Project

Figure 1

Vegetation Communities Cañada Road Segment

Service Layer Credits: Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, TRC 2014, PG&E 2014



Service Layer Credits: Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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Figure shows project as analyzed in FMND; red arrows indicate changes proposed in this addendum.

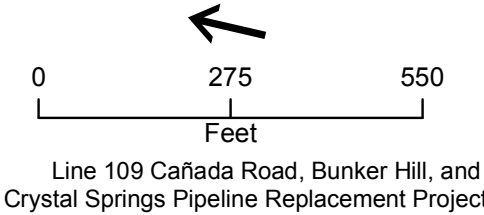
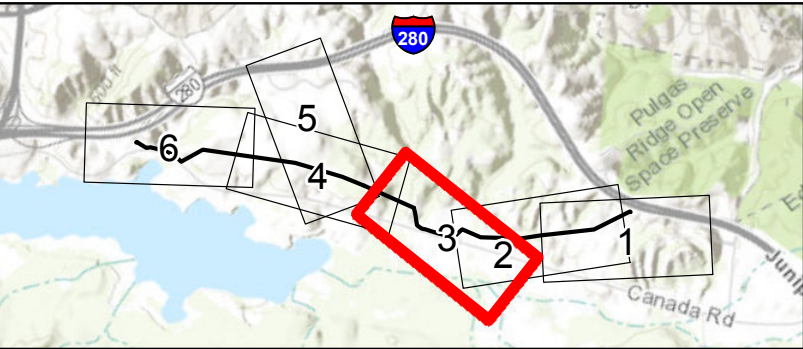
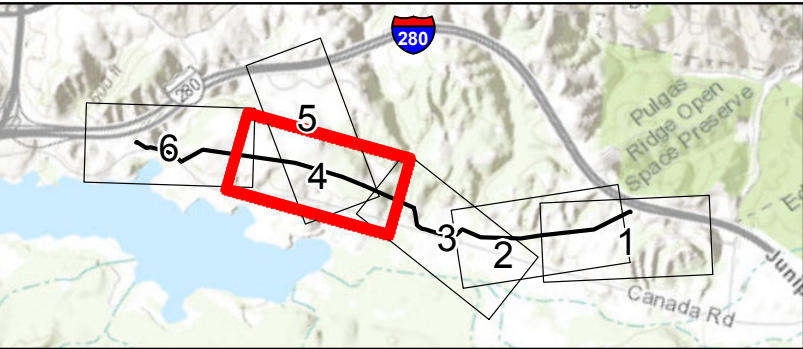
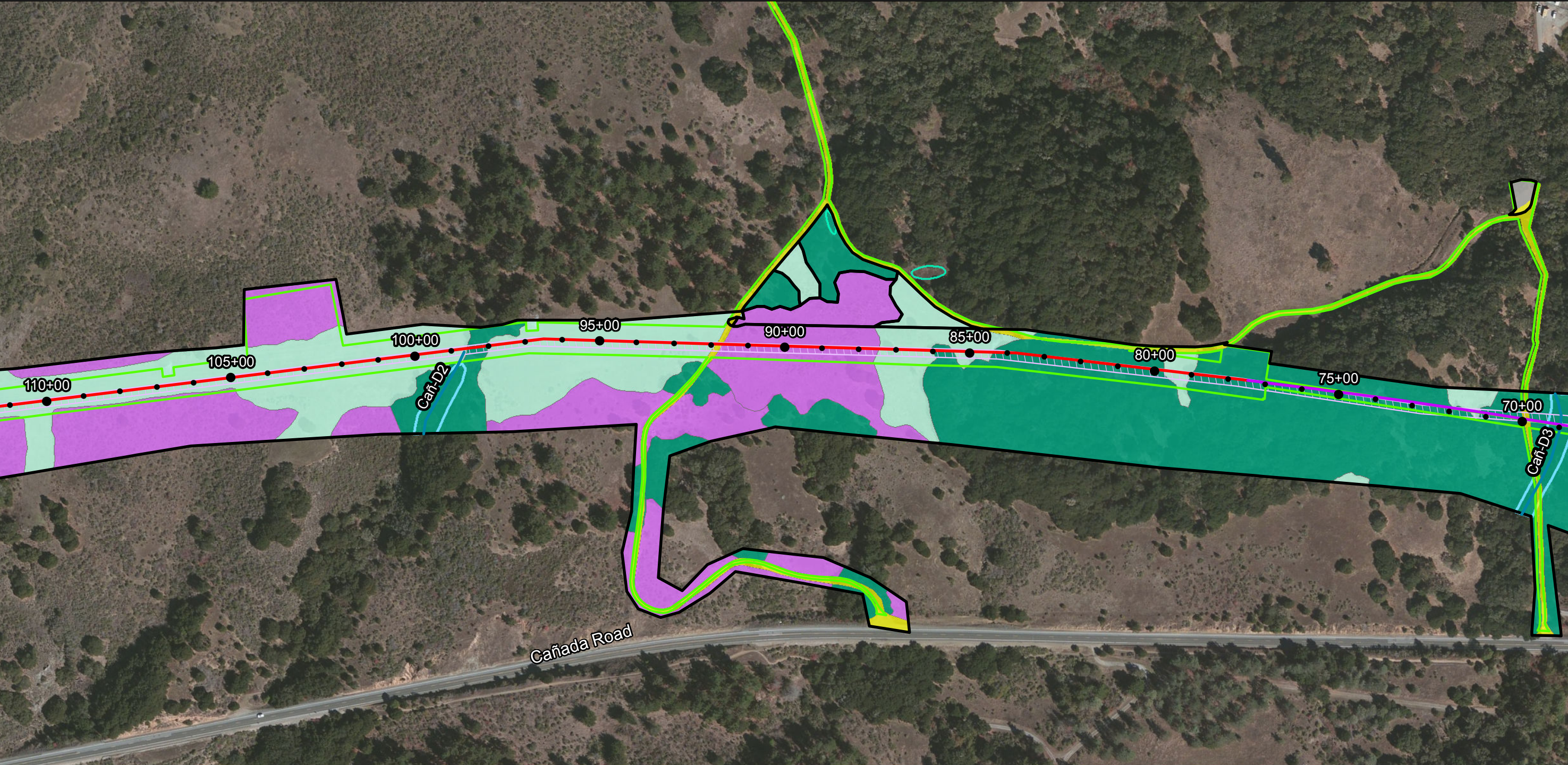


Figure 3
Vegetation Communities
Cañada Road Segment

Proposed changes: Install temporary bridges at D3 and D4 for construction access. Use drainage flumes rather than coffer dams, in same drainages, for construction water diversion. Trench pipeline crossing at D4 rather than previously-proposed aerial crossing.

Service Layer Credits: Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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Legend

- Line 109 Cañada Road Pipeline Replacement
- Aerially Spanned Pipeline Replacement
- HDD Pipeline Replacement
- Stationing
- Construction Work Area
- Proposed Permanent Easement

- Access Roads
- Project Survey Area
- Wetland Features**
- Ephemeral Stream
- Non-jurisdictional Cement-lined V-ditch
- Riparian

Vegetation Communities

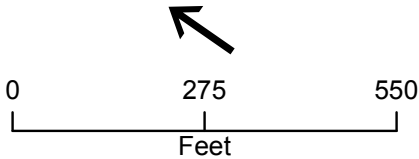
- Coast live oak woodland
- Coastal sage scrub
- Coyote bush scrub
- Needlegrass Grassland
- Disturbed

Special Status Plants

- Franciscan onion (*Allium peninsulare* var. *franciscanum*)
- Bent-flowered fiddleneck (*Amsinckia lunaris*)

- Bush Mallow (*Malacothamnus Hallii*)
- Choris' popcornflower (*Plagiobothrys chorisianus* var. *chorisianus*)
- San Francisco blue eyed mary (*Collinsia multicolor*)

Proposed changes: Install temporary bridges at Can-D2 and D3 for construction access. Use drainage flumes rather than coffer dams, in same drainages, for construction water diversion.



Line 109 Cañada Road, Bunker Hill, and Crystal Springs Pipeline Replacement Project

Figure 4
Vegetation Communities
Cañada Road Segment

Service Layer Credits: Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, TRC 2014, PG&E 2014

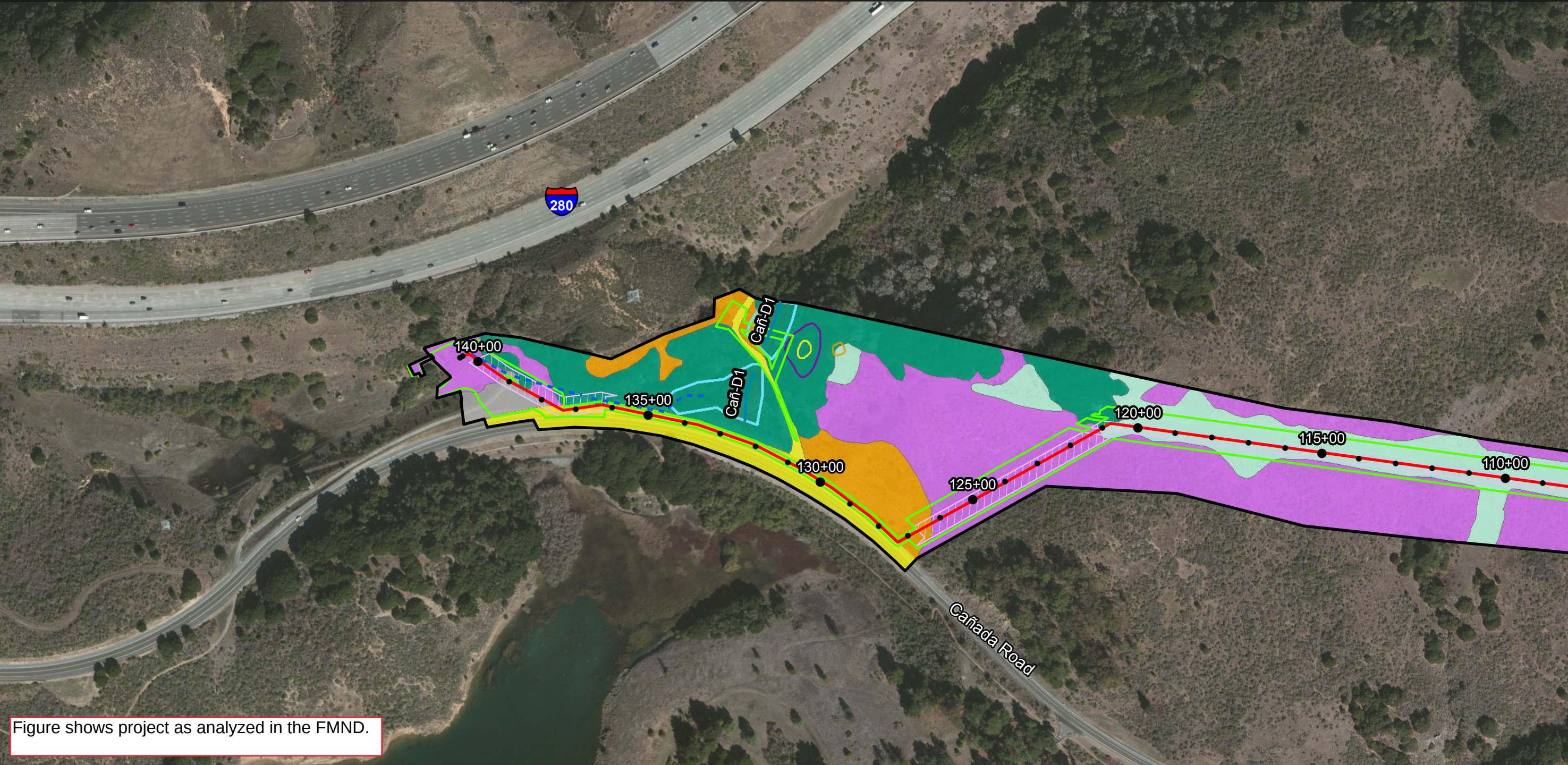
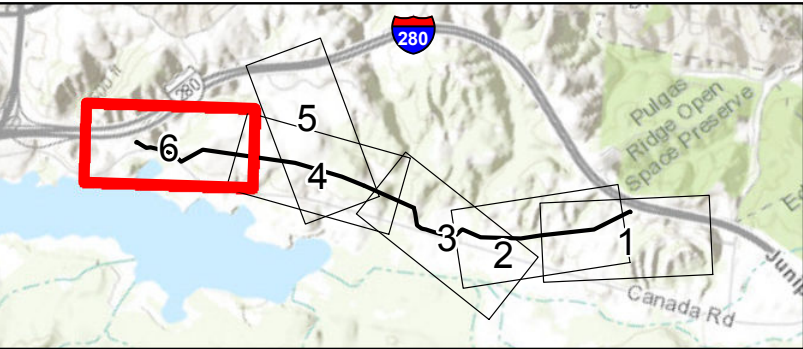


Figure shows project as analyzed in the FMND.



Legend

- Line 109 Cañada Road Pipeline Replacement
- Aerially Spanned Pipeline Replacement
- HDD Pipeline Replacement
- Stationing
- Construction Work Area
- Proposed Permanent Easement

Access Roads

- Access Roads

Project Survey Area

- Project Survey Area

Wetland Features

- Ephemeral Stream
- Non-jurisdictional Cement-lined V-ditch
- Riparian

Vegetation Communities

- Coast live oak woodland
- Coastal sage scrub
- Coyote bush scrub
- Needlegrass Grassland
- Disturbed

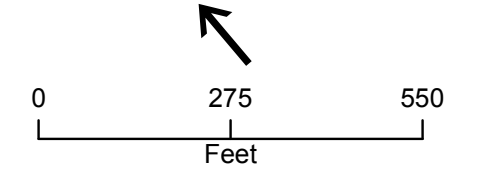
Special Status Plants

- Franciscan onion (Allium peninsulare var. franciscanum)
- Bent-flowered fiddleneck (Amsinckia lunaris)

Special Status Plants

- Bush Mallow (Malacothamnus Hallii)
- Choris' popcornflower (Plagiobothrys chorisianus var. chorisianus)
- San Francisco blue eyed mary (Collinsia multicolor)

No changes from project as analyzed in Final Mitigated Negative Declaration



Line 109 Cañada Road, Bunker Hill, and Crystal Springs Pipeline Replacement Project

Figure 6
Vegetation Communities
Cañada Road Segment

Service Layer Credits: Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, TRC 2014, PG&E 2014

Illustrative photographs of flume device proposed for use in drainage water diversion





**PG&E Gas Transmission Line 109 Cañada Road, Bunker Hill and Crystal Springs Pipeline
Replacement Project San Mateo County
Final Mitigated Negative Declaration, Addendum 2**

Attachment B. Modified Mitigation Measure BI-1f: Habitat Restoration.

Mitigation Measure BI-1f. Habitat Restoration (Amended)

The following general habitat protection measures shall be implemented for the proposed project:

- Prior to construction, PG&E shall coordinate with the SFPUC to prepare and equipment and material arriving on site is clean and free of soils and plant material, and will include tire-wash requirements for equipment that has been driven off-road prior to arriving at the proposed project sites.
- Riparian and other wetland areas within the proposed project sites shall be denoted as environmentally sensitive areas and will be avoided during construction, to the extent practicable, or as otherwise directed by the regulatory agencies.
- Special-status plant colonies that have been identified for avoidance shall be fenced to prevent encroachment by construction activities.
- Crystal Springs *lessingia* individuals that cannot be avoided in areas to be cleared or grubbed shall have seed or vegetative material containing seed collected at the appropriate time, to be stored and distributed on top of the salvaged topsoil when it is redistributed.
- The topsoil from trenching through grasslands, and other plant communities with predominantly native plant species, shall be salvaged and stockpiled separately in upland construction work areas. Topsoil shall be stored in such a way that it is protected from invasive propagules, but does not overheat and kill off the native plant propagules. This shall include placing the stored topsoil where it is not in contact with non-native grassland soil and protecting it with weed-free straw mulch or other suitable cover. Following construction, the salvaged topsoil will be spread over the disturbed area from which it was removed, and the area will be graded to match the pre-construction natural grade. Once the salvaged topsoil has been spread and the area returned to the pre-existing topography, the area will be revegetated with locally collected (where possible) native grassland species. If topsoil in grasslands has a substantial population of non-native plant species, as identified in the Vegetation Restoration Plan, it may be buried below the subsoil during backfill, and the serpentine soils from deeper in the trench placed on the surface.
- Existing topography shall be restored to pre-project conditions to the extent possible. For herbaceous and grass-dominated riparian areas, it is expected that revegetation will naturally occur once the topography is restored using topsoil salvage requirements. Riparian areas will be revegetated with an appropriate mix of native plants, including species such as creeping wild rye, meadow barley, blue wild rye, arroyo willow, California bay, and coast live oak, as shall be detailed in the Vegetation Restoration Plan.
- Prior to the start of construction, PG&E shall develop a two-part Vegetation Restoration Plan in coordination with the SFPUC and the appropriate resource agencies for on-site vegetation restoration (Vegetation Restoration Plan, Part 1) and off-site vegetation restoration (Vegetation Restoration Plan, Part 2). PG&E shall submit the Vegetation Restoration Plans to CDFW and SFPUC for review and

approval and will be responsible for ensuring that the Vegetation Restoration Plans are implemented under the guidance of a qualified biologist.

- Tree replanting, under Vegetation Restoration Plan, Part 2 (detailed below) shall conform to the following priorities: (1) replacement trees shall first be planted on-site in the ROW on the SFPUC Peninsula Watershed, to the extent consistent with the SFPUC's Peninsula Watershed Management Plan, as determined by SFPUC's Natural Resources Land Management Division biologist; (2) any replacement trees that exceed the capacity of the Peninsula Watershed, as determined by SFPUC's Natural Resources Land Management Division biologist, shall be replanted offsite as detailed below, under Vegetation Restoration Plan, Part 2.
- ~~The~~ Vegetation Restoration Plan, Part 1 shall include the following measures:
 - Mitigation under the Vegetation Restoration Plan, Part 1 shall consist of a minimum 1:1 ratio of on-site restoration of sensitive habitats and plant communities, including needlegrass grassland, serpentine grassland, riparian areas, ~~coast live oak woodland,~~ and shrublands. ~~Tree replacement ratios shall be 3:1 for native oak trees.~~
 - Vegetation Restoration Plan, Part 1 ~~The plan will~~ shall identify specific areas of topsoil to be salvaged during construction for re-spreading, as well as areas where topsoil carries a greater percentage of non-native species; in the latter areas, topsoil may be buried under fresher material. PG&E shall develop seed mixes for each plant community, consisting of locally collected native species. Following construction, the sites will be prepared and stabilized with coir or weed-free rice straw (or jute netting material in steeper areas), and vegetation will be restored using the defined seed mixes appropriate to each area.
 - Additional plantings of shrubs ~~and tree propagules~~ will be completed in the appropriate plant communities during the fall or winter immediately following construction. Replacement shall occur within the temporary construction work spaces and adjacent areas, as determined in coordination with the SFPUC Natural Resources and Lands Management Division and other applicable resource agencies.
 - ~~Non native trees, such as Monterey pine, Monterey cypress, and eucalyptus, shall be replaced with native tree species if they meet the definition of "Significant" trees in the San Mateo County Significant Tree Ordinance (see Impact BI 1e).~~
 - To minimize the temporal loss of ~~trees and~~ shrubs, when site conditions permit, a variety of native ~~trees and~~ shrubs with different growth rates shall be planted to ensure that nest and roost sites will be available in the short term for birds and bats. However, due to the risk of the spread of *Phytophthora*¹, and other soilborne diseases through introduction of plants grown in soil offsite, replanting on the Peninsula Watershed is limited to the use of seeds. The use of seedlings and plants of mixed sizes to minimize temporal loss of oak

¹ a fungal plant infestation responsible for Sudden Oak Death and other plant diseases

woodland habitat at off-site restoration areas is addressed below under Vegetation Restoration Plan, Part 2.

- ~~PG&E will be responsible for ensuring that the Vegetation Restoration Plans are is implemented under the guidance of a qualified biologist.~~ Vegetation Restoration Plan, Part 1 plan shall be designed such that it meets the following success criteria, or other equally protective success criteria, as approved by the resource agencies:
 - The restored sites are ~~is~~ composed of a mix of appropriate native species appropriate for each site, as outlined in the Vegetation Restoration Plans.
 - Cover of non-native invasive weed species shall not exceed 20 percent within serpentine grassland areas. This criterion may be revised, if approved by CDFW, if it is deemed that achieving 20 percent cover is not reasonable due to the presence of high levels of non-native invasive weeds adjacent to the project area.
 - The restored sites has~~ve~~ at least 75 percent of the preconstruction baseline cover.
 - After revegetation and restoration are completed, monitoring of vegetation replanted under Vegetation Restoration Plan, Part 1 shall be conducted by a restoration specialist or biologist for a minimum of 5 years. The sponsor can choose to continue monitoring for an additional year for each year of below-average precipitation during the monitoring period. If by the end of monitoring the approximately 5.8 acres of serpentine grasslands temporarily disturbed by construction fails to meet the restoration success criteria, then PG&E shall provide for additional off-site mitigation at a ratio of two acres for each acre of serpentine grassland that fails to achieve success criteria, unless otherwise approved by the applicable regulatory agencies. Serpentine grasslands shall be evaluated as separate units based on their location along a given pipeline segment (i.e., Bunker Hill), or obvious breaks in the continuity or composition of the serpentine grassland communities within a given pipeline segment. Serpentine units for the purposes of monitoring the success criteria shall be identified in the Vegetation Restoration Plan.
 - Off-site mitigation under Vegetation Restoration Plan, Part 1 could include funding of serpentine grassland restoration, such as through the Presidio Trust Stewardship Program in San Francisco.² Funding would be tied to the number of acres of serpentine grasslands restored through actions that may include tree and brush removal, exotic species management, grassland cover management (i.e., mowing, grazing, rotational tarping, and reseeding), and monitoring.
- Vegetation Restoration, Part 2. For any required replanting that exceeds the tree replanting capacity of the SFPUC Peninsula Watershed as determined by the SFPUC's Natural Resources Land

² National Park Service and Presidio of San Francisco. 2001. Vegetation Management Plan and Environmental Assessment.

Management Division biologist, PG&E shall be responsible for restoration of former oak woodland by planting oaks and other native trees in a restoration area or areas in Wunderlich County Park, or at another appropriate off-site restoration location in eastern San Mateo County to be identified by PG&E in consultation with and approval by CDFW. Selection of the woodland replacement or restoration site(s), determination of the appropriate density for replanting, and implementation of the restoration/ replanting program shall be as directed by CDFW and shall be supervised by a qualified arborist, horticulturist, landscape architect or landscape contractor. Restoration/planting sites shall be suitable for restoration of oak woodland comparable to that removed, based on slope, soil type, exposure, drainage and other suitability factors as determined by the restoration specialist. The Vegetation Restoration, Part 2 restoration effort shall be planned, funded, implemented and maintained by PG&E in consultation with, and as approved, by CDFW and the land manager of the proposed restoration site, and shall be prepared and implemented as follows:

- PG&E shall prepare a Vegetation Restoration Plan, Part 2 (Oak Woodland Restoration Plan), consistent with the requirements of tree replanting ratios set forth in mitigation measures BI-1f and B 5, for planting of the required oak and other native woodland species and for replacement of Significant and Heritage trees, as follows:
 - Tree replacement ratios shall be 3:1 for native oak trees; and
 - Minimum 1:1 ratio of restoration of sensitive habitats and plant communities including, riparian areas, coast live oak woodland, and shrublands not replaced under Vegetation Restoration Plan, Part 1; and
 - Each native tree that meets the definition of “Significant” tree or “Heritage” tree in the San Mateo County Significant Tree Ordinance (see FMND Impact BI-5), shall be replaced at a 3:1 ratio; and
 - Non-native trees, such as Monterey pine, Monterey cypress, and eucalyptus, shall be replaced with 1:1 with native tree species
 - Alternatively, an acreage metric may be considered to satisfy the tree replanting requirements set forth in mitigation measures BI-1f and B 5. This alternative acreage metric for tree replacement shall only be used if reviewed and approved by CDFW and based on upon site specific circumstances. Acreage would be based on area needed for replacement of lost oak woodland habitat with restored high quality woodland habitat, at similar tree densities to the habitat(s) removed, and at a ratio of 3 acres restored for each 1 acre of habitat lost through tree removal.
- CDFW shall review PG&E’s arborist reports to determine final number of oaks and other native trees, and the final number of significant and heritage trees of any variety that were removed and that require replacement under the criteria set forth in the FMND.

- The primary focus of the Vegetation Restoration Plan, Part 2 shall be native tree planting and oak woodland restoration off-site, to include any trees needed to meet the require replanting ratios that cannot be accommodated on the Peninsula Watershed. However, the Vegetation Restoration Plan, Part 2 may include limited tree replanting on the Peninsula Watershed to the extent consistent with SFPUC's Natural Resources Land Management Division (NRLMD) watershed management goals, and as determined by the SFPUC biologist.
- Vegetation restoration may be achieved through a combination of active and passive methods. "Passive" restoration would begin with removal of invasive non-native trees and from the restoration site, followed active by fostering of naturally-recruited oaks and other oak woodland species through measures such as acorn planting, irrigation, and installation of tree protection. The success of such efforts shall be monitored by a qualified biologist to meet the tree restoration ratios specified in this measure and shall be augmented annually with additional adaptive management measures restoration does not proceed at a rate expected to achieve restoration targets within the seven-year monitoring period.
- Replanting/ restoration under the plan shall include an appropriate range, mix and density of native species present in healthy native oak woodland at the restoration/ replanting site, as determined by San Mateo County Parks or other restoration site land manager in consultation with CDFW. Replanting on the Peninsula Watershed, and potentially at the off-site location, is limited to the use of seeds due to the risk of *Phytophthora* and other soilborne diseases. However, to minimize the temporal loss of trees and shrubs, a variety of native trees and shrubs with different growth rates shall be planted at the offsite restoration site(s), as site conditions permit, to ensure that nest and roost sites will be available in the short term for birds and bats. Consistent with the County's significant and Heritage Tree ordinances, seedlings and larger boxed plants shall be included in the plant mix, as feasible to reduce the temporal duration of the loss of habitat, and improve the replanting success rate. To this end, PG&E will make a good faith effort to procure nursery container stock cultivated using best management practices for control of *Phytophthora* and other soilborne diseases³. At the discretion of the land manager at the offsite restoration site(s), seed planting may be used in part and/or in lieu of planting of nursery stock, if "clean" nursery stock cannot be assured.
- Appropriate planting densities may vary depending on the restoration site, but the restoration goal is successful restoration at a density of approximately 90 oak trees per acre for oak woodland and 40 oaks per acre for oak savannah.

³ <http://phytosphere.com/BMPsnursery/Index.htm>

- To ensure a successful revegetation effort, all plantings shall be irrigated as necessary for a minimum of three years and monitored and maintained as necessary for a minimum of 7 years with a minimum of 4 consecutive years (4 growing seasons) of monitoring after the removal of irrigation, with the goal of a minimum of 80 percent survival of all plantings, at the end of the minimum monitoring period. If the restoration has not met these goals after seven years, PG&E shall be responsible for replacement planting, additional watering, weeding, invasive exotic eradication, or other practice, to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements for 3 years after planting.
- The Vegetation Restoration Plan Part 2 shall detail the following:
 - Proposed native species mixes and proportions of plant sizes;
 - Site preparation procedures for removal of non-native invasive species in the replanting area, and other site preparation as needed to accomplish effective restoration;
 - Procedures and mechanisms for ongoing invasive species eradication and control and protection from herbivores;
 - Irrigation plan and schedule, for at least the first three years following planting; and
 - Monitoring schedule, and procedures and timing for identification and replacement of failed replanting.
- A plan that meets these specifications must be submitted to CDFW and the land manager at the off-site restoration site no later than August 30, 2018. The Oak Woodland Restoration Plan shall be reviewed and must have the approval, in advance of implementation, of CDFW and San Mateo County Parks, and (with respect to any planting proposed on SFPUC land) of SFPUC, and must be fully implemented within 10 years of the project's initial tree removals (that is, by 2026).
- If for any reason these planned actions are determined to be infeasible to the extent currently planned, and Project Sponsor's full tree planting obligation cannot be attained at Wunderlich County Park, Project Sponsor shall identify and plan for restoration of another a restoration site within eastern San Mateo County where the measure can be implemented, within six months of the date that the Wunderlich or SFPUC options are determined infeasible.
- In the event that, after good-faith effort by PG&E to meet the mitigation requirements above through a plan for restoration at the Wunderlich site or another site in eastern San Mateo County, CDFW determines that the restoration as described above is infeasible in eastern San Mateo County, PG&E may alternatively compensate for impacts on oak woodlands in whole or in part through a contribution to the Oak Woodlands

Conservation Fund as established under subdivision (a) of Section 1363 of the Fish and Game Code; or by purchase of high quality oak woodland and establishment of a conservation easement, and donation of this land to the San Mateo County parks or other oak woodland land manager. The amount of the fee/ purchase shall be calculated based on;

- The value of 5.5 acres of land with high quality preserved oak woodland habitat in western San Mateo County; or
 - The value of 16.5 acres of land in San Mateo County suitable for oak woodland restoration (to accommodate trees removed at 3: 1 ratio), plus the estimated cost of that restoration; or
 - Another appropriate metric developed by a qualified restoration biologist in collaboration with the California Department of Fish and Game. This alternate compensation calculation shall reflect differences in habitat quality, and may consider the cost of lands with comparable habitat (fee title or easement) in nearby areas and shall be subject to CDFW approval.
- Tree replanting on the Peninsula Watershed shall begin by January 15, 2019, or within 90 days of the conclusion of construction if construction has not been completed by January 15. Off-site restoration work, including initial planting of acorns, shall begin as soon as all necessary regulatory approvals have been received, but no later than December 2018. In recognition of the temporal aspect/context of impacts to habitat and the effect of delaying compensatory mitigation on habitat functionality, the compensation ratio requirements shall be increased to 4:1 for tree removals that do not begin to receive mitigation within 18 to 24 months (as determined by CDFW) after initial tree removal; taking into account the staggered dates of tree removal on the successively-constructed Crystal Springs, Bunker Hill Road and Canada Road segments of the project. Any increase in the tree planting requirement shall also be reflected in a comparable increase in required restoration acreage to accommodate the trees at an acceptable replanting density as determined by CDFW; and/or in the cost of compensatory mitigation, as detailed above, to reflect the larger number of trees.

Attachment C: MITIGATION MONITORING AND REPORTING PROGRAM

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
MITIGATION MEASURES AGREED TO BY PG&E				
AESTHETICS				
Mitigation Measure M-AE-4: Nighttime Lighting Nighttime lighting shall be shielded and directed specifically onto work areas to minimize light spillover, away from sensitive receptors such as the residences and open spaces adjacent to the project areas.	Project Sponsor is responsible for contractor compliance.	During construction activities.	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.	Considered complete after construction activities have ended.
CULTURAL AND PALEONTOLOGICAL RESOURCES				
Mitigation Measure M-CR-2: Archeological Monitoring The following measures shall be undertaken to avoid any potentially significant adverse effect from the proposed project on buried or submerged historical resources within areas of moderate and high sensitivity for buried resources. The project sponsor shall retain the services of an archeological consultant from the rotational Department Qualified Archeological Consultants List (QACL) maintained by the Planning Department archeologist. The project sponsor shall contact the Planning Department archeologist to obtain the names and contact information for the next three archeological consultants on the QACL. The archeological consultant shall undertake an archeological monitoring program. All plans and reports prepared by the consultant, as specified herein, shall be submitted first and directly to the Environmental Review Officer (ERO) for review and comment, and shall be considered draft reports subject to revision until final approval by the ERO. Archeological monitoring and/or data recovery programs required by this measure could suspend construction of the project for up to a maximum of 4	Project Sponsor to retain appropriate qualified consultant (selected from the QACL).	During pre-construction and construction activities, including project related soil-disturbing activities.	Project Sponsor to prepare Archaeological Monitoring Program (AMP) in consultation with the ERO. Project Sponsor to prepare Archaeological Data Recovery Program with consultation with the ERO. If applicable, upon discovery of human remains and/or associated or unassociated funerary objects, Project Sponsor shall notify the Coroner	Considered complete after construction and soil-disturbing activities have ended and FARR is approved by the ERO.

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
weeks. At the direction of the ERO, the suspension of construction can be extended beyond 4 weeks only if such a suspension is the only feasible means to reduce potential effects on a significant archeological resource—as defined in CEQA Guidelines Section 15064.5 (a)(c)—to a less-than-significant level. <i>Archeological Monitoring Program (AMP).</i> The AMP shall minimally include the following provisions: • The archeological consultant, project sponsor, and ERO shall meet and consult on the scope of the AMP reasonably prior to any project-related ground-disturbing activities. The ERO—in consultation with the project archeologist—shall determine which project activities shall be archeologically monitored. In most cases, any ground-disturbing activities—such as demolition, foundation removal, excavation, grading, utilities installation, foundation work, driving of piles (foundation, shoring, etc.), site remediation, etc.—shall require archeological monitoring because of the potential risk that these activities pose to archeological resources and to their depositional context. The results of this meeting, including the schedule, shall be documented in a brief monitoring plan that shall be distributed to the ERO, project sponsor, and the archeological consultant. • The archeological consultant shall advise all project contractors to be on the alert for evidence of the presence of the expected resource(s), of how to identify the evidence of the expected resource(s), and of the appropriate protocol in the event of apparent discovery of an archeological resource. • The archeological monitor(s) shall be present at the project site according to a schedule that is agreed upon by the archeological consultant and the ERO until the ERO has, in consultation with the archeological consultant, determined that project construction activities would have no impact on significant archeological			of the City and County of San Francisco (CCSF), and in the event the Coroner determines that the remains are human, notify the California NAHC who shall appoint a MLD who shall make reasonable efforts to develop an agreement for the treatment of human remains and/or associated or unassociated funerary objects. Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.	

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
deposits.				
- The archeological monitor shall record and be authorized to collect soil samples and artifactual/ecofactual material, as warranted for analysis. - If an intact archeological deposit is encountered, all soil-disturbing activities in the vicinity of the deposit shall cease. The archeological monitor shall be empowered to temporarily redirect demolition/excavation/pile driving/construction crews and heavy equipment until the deposit is evaluated. If in the case of pile-driving activity (foundation, shoring, etc.), the archeological monitor has cause to believe that the pile-driving activity may affect an archeological resource, the pile-driving activity shall be terminated until an appropriate evaluation of the resource has been made in consultation with the ERO. The archeological consultant shall immediately notify the ERO of the encountered archeological deposit. The archeological consultant shall, after making a reasonable effort to assess the identity, integrity, and significance of the encountered archeological deposit, present the findings of this assessment to the ERO.				

Consultation with Descendant Communities. On discovery of an archeological site¹ associated with descendant Native Americans or other appropriate descendent group, an appropriate representative² of the descendant group and the ERO shall be contacted. The representative of the descendant group shall be given the opportunity to monitor archeological field investigations of the site and to consult with the ERO regarding appropriate archeological treatment of the site, of recovered data from the site, and, if applicable, any interpretative treatment of the

¹ By the term “archeological site” is intended here to minimally include any archeological deposit, feature, burial, or evidence of burial.

² An “appropriate representative” of the descendant group is here defined to mean, in the case of Native Americans, any individual listed in the current Native American Contact List for the City and County of San Francisco maintained by the California Native American Heritage Commission and in the case of the Overseas Chinese, the Chinese Historical Society of America.

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
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associated archeological site. A copy of the Final Archeological Resources Report shall be provided to the representative of the descendant group.

If the ERO, in consultation with the archeological consultant, determines that a significant archeological resource is present and that the resource could be adversely affected by the proposed project, at the discretion of the project sponsor, either:

- the proposed project shall be re-designed so as to avoid any adverse effect on the significant archeological resource; or
- an archeological data recovery program shall be implemented, unless the ERO determines that the archeological resource is of greater interpretive than research significance and that interpretive use of the resource is feasible.

If an archeological data recovery program is required by the ERO, the archeological data recovery program shall be conducted in accord with an archeological data recovery plan (ADRP). The project archeological consultant, project sponsor, and ERO shall meet and consult on the scope of the ADRP. The archeological consultant shall prepare a draft ADRP that shall be submitted to the ERO for review and approval. The ADRP shall identify how the proposed data recovery program will preserve the significant information that the archeological resource is expected to contain. That is, the ADRP will identify what scientific/historical research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historical property that could be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archeological resources if nondestructive methods are practical.

The scope of the ADRP shall include the following elements:

- Field Methods and Procedures. Descriptions of proposed field

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
strategies, procedures, and operations. • Cataloguing and Laboratory Analysis. Description of selected cataloguing system and artifact analysis procedures. • Discard and Deaccession Policy. Description of and rationale for field and post-field discard and deaccession policies. • Interpretive Program. Consideration of an on-site/off-site public interpretive program during the course of the archeological data recovery program. • Security Measures. Recommended security measures to protect the archeological resource from vandalism, looting, and non-intentionally damaging activities. • Final Report. Description of the proposed report format and distribution of results. • Curation. Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities.				
<i>Human Remains, Associated or Unassociated Funerary Objects.</i> The treatment of human remains and of associated or unassociated funerary objects discovered during any ground-disturbing activities shall comply with applicable state and federal laws, including immediate notification of the coroner of the County of San Mateo and, in the event of the coroner's determination that the human remains are Native American, notification of the California Native American Heritage Commission, who shall appoint a most likely descendant (MLD) (Public Resources Code Section 5097.98). The archeological consultant, project sponsor, landowner, and MLD shall make all reasonable efforts to develop an agreement for the treatment of, with appropriate dignity, human remains and associated or				

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
unassociated funerary objects (CEQA Guidelines Section 15064.5[d]). The agreement should take into consideration the excavation, removal, recordation, analysis and curation (as appropriate), possession, and final disposition of the human remains and associated or unassociated funerary objects. <i>Final Archeological Resources Report.</i> The archeological consultant shall submit a Draft Final Archeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archeological resource and describes the archeological and historical research methods employed in the archeological testing/monitoring/data recovery program(s) undertaken. Information that may put at risk any archeological resource shall be provided in a separate removable insert within the draft final report. <i>Copies of the Draft FARR shall be sent to the ERO for review and approval.</i> Once approved by the ERO, copies of the FARR shall be distributed as follows: California Archeological Site Survey NWIC shall receive one copy and the ERO shall receive a copy of the transmittal of the FARR to the NWIC. The Environmental Planning division of the Planning Department shall receive one bound; one unbound; and one unlocked, searchable PDF copy on CD of the FARR along with copies of any formal site recordation forms (CA DPR 523 series) and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources. In instances of high public interest or interpretive value, the ERO may require a different final report content, format, and distribution than that presented previously.			Project Sponsor to prepare draft and final Archeological Resources Reports. The ERO to review and approve the Final Archeological Resources Report.	
Mitigation Measure M-CR-3: Unanticipated Discoveries for Human Remains In the unlikely event that human remains or potential human remains are uncovered during construction, the find shall be secured and the project Head Foreman and/or PG&E shall immediately notify the ERO and suspend any ground-disturbing activities within 100 feet, or a distance	Project Sponsor to retain appropriate qualified consultant (selected from the QACL).	During construction activities, including excavation and/or earthmoving operations.	If applicable, upon discovery of human remains and/or associated or unassociated funerary objects, Project Sponsor shall notify the Coroner	Considered complete after construction activities have ended and final report accepted by

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
recommended by the monitor, of the discovery until the ERO has determined what additional measures should be undertaken. If the remains are not human, the ERO shall determine whether the find represents an archeological deposit and whether Mitigation Measure M-CR-2 applies. If the remains are human, the ERO shall immediately implement the applicable state law, which can be found in Sections 5097.9 through 5097.996 of the Public Resources Code. This shall begin with the immediate notification of the San Mateo County Coroner. All archeological work conducted under this mitigation measure shall be subject to review by the ERO or designee.			of the CCSF, and in the event the Coroner determines that the remains are human, notify the California NAHC, who shall appoint a MLD who shall make reasonable efforts to develop an agreement for the treatment of human remains and/or associated or unassociated funerary objects. Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.	ERO.
<i>Mitigation Measure M-CR-4: Tribal Cultural Resources Interpretive Program</i> If the Environmental Review Officer (ERO) determines that preservation-in-place of previously unidentified archeological resources pursuant to Mitigation Measure M-CR-2, Archeological Monitoring, is not a sufficient or feasible option, and if in consultation with the affiliated Native American tribal representatives, the ERO determines that the resource constitutes a TCR, the project sponsor shall implement an interpretive program of the TCR in consultation with affiliated tribal representatives. An interpretive plan produced	Project Sponsor	During pre-construction and construction activities.	Project Sponsor to prepare interpretive plan produced in consultation with the ERO and affiliated tribal representatives.	Considered complete after displays or installation are in place.

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
in consultation with the ERO and affiliated tribal representatives, at a minimum, and approved by the ERO would be required to guide the interpretive program. The plan shall identify, as appropriate, proposed locations for installations or displays, the proposed content and materials of those displays or installation, the producers or artists of the displays or installation, and a long-term maintenance program. The interpretive program may include artist installations, preferably by local Native American artists, oral histories with local Native Americans, artifacts displays and interpretation, and educational panels or other informational displays.				
NOISE				
<i>Mitigation Measure M-NO-1a: Install Sound Barrier Wall</i>	Project Sponsor is responsible for contractor compliance.	During HDD construction activities.	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.	Considered complete after construction activities have ended.
<i>Mitigation Measure M-NO-1b: Notify Nearby Residents of HDD Activities</i>	Project Sponsor	2 weeks prior and 1 day prior to HDD activities near potentially affected residents.	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.	Considered complete after HDD construction activities have ended.
PG&E shall notify residents that may experience sound levels above 70 dBA during daytime drilling and above 50 dBA during nighttime drilling at the Bunker Hill segment—based on modeling results—in writing 2 weeks prior and again 1 day prior to daytime and potential nighttime HDD activities.				

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
<i>Mitigation Measure M-NO-1c: Temporarily Relocate Nearby Residents from Nighttime HDD Activities</i> For the limited locations where PG&E is unable to mitigate noise through Mitigation Measure M-NO-1a, PG&E shall, on a case-by-case basis when there are special circumstances—such as those residents with verified special medical conditions—offer to temporarily relocate residents to a nearby hotel for the 1 night of potential HDD activities. Special medical conditions shall be verified by a doctor.	Project Sponsor	During HDD construction activities.	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.	Considered complete after HDD construction activities have ended.

AIR QUALITY

Mitigation Measure M-AQ-1a: Dust Control

For the Cañada Road segment and any other areas not already subject to the Asbestos Air Toxic Control Measure, PG&E shall post one or more publicly visible signs with the telephone number and person to contact at PG&E with complaints related to excessive dust or vehicle idling. This person shall respond to complaints and, if necessary, take corrective action within 48 hours. The telephone number and person to contact at the BAAQMD's Compliance and Enforcement Division shall also be provided on the sign(s) in the event that the complainant also wishes to contact the applicable air district.

In addition, to limit dust, criteria pollutants, and precursor emissions associated with project construction, the following BAAQMD-recommended Basic Construction Measures shall be required for the Cañada Road segment and any other areas not already subject to the Asbestos Air Toxic Control Measure:

- Water all active construction areas with exposed soil surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved

Project Sponsor is responsible for contractor compliance.

During pre-construction and construction activities, including project related soil-disturbing activities.

Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.

Considered complete after construction activities have ended.

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
access roads that have not been stabilized with soil binder, mulch, gravel, vegetation or other cover) sufficiently to prevent dust from becoming airborne. Reclaimed water should be used whenever possible. • All haul trucks transporting soil, sand, or other loose material off site shall be covered. • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. • Vehicle speeds on unpaved areas shall be limited to 15 mph. • All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. • Idling times for construction equipment (including vehicles) shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes, except for situations allowed under California's commercial vehicle idling regulations. Clear signage of this requirement shall be provided for construction workers at all access points to construction areas. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.				
Mitigation Measure M-AQ-1b: Construction Emissions Minimization Plan Prior to construction, PG&E shall submit a Construction Emissions Minimization Plan to the Environmental Review Officer (ERO) for review	Project Sponsor is responsible for contractor compliance.	During pre-construction and construction activities, including	ERO shall be responsible for Project Sponsor compliance.	Considered complete after construction activities have

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
and approval by an Environmental Planning Air Quality Specialist. The plan shall detail project compliance with the following requirements:		project related soil-disturbing activities		ended.
1. All on-road and off-road construction equipment engine tiers shall be consistent with the United States Environmental Protection Agency (USEPA) engine tiers provided in Table M-AQ-1b-1: Construction Equipment Summary, below. Documentation of equipment tiers for in-use equipment shall be maintained on site as part of the plan.				
2. Construction equipment, as noted in Table M-AQ-1b-1, shall be equipped with CARB-approved Level III Verified Diesel Emission Control Strategies (VDECS). Documentation of VDECS for in-use Tier III equipment shall be maintained on site as part of the plan. To accomplish this, diesel particulate filters (DPF) will be utilized.				

Should any deviations from the requirements or the equipment in Table M-AQ-1b-1: Construction Equipment Summary, be proposed prior to or during construction, the project sponsor shall demonstrate, to the satisfaction of the ERO, that an equivalent amount of emissions reduction would be achieved.

Table M-AQ-1b-1: Construction Equipment Summary

Phase	Equipment Type	Horsepower	Quantity	Engine Tier	DPF Required?
<i>Linear Work Phases</i>					
1 & 2	Other Material Handling Equipment	120	4	NA - Gasoline	No
1 & 2	Off-Highway Trucks	250	3	Tier 4 (Final)	No
1 & 2	Tractors/Loaders/Backhoes	175	1	Tier 4 (Interim)	No
2	Graders	250	1	Tier 3	Yes
2	Rubber Tired Dozers	750	2	Tier 4 (Final)	No

Considered complete after review of Construction Emissions Minimization Plan during pre-construction, construction check of plan, and post-construction activities have ended and construction activities have ended.

Adopted Mitigation Measures						Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
2	Air Compressors	50	1	Tier 3	Yes				
4	Other Material Handling Equipment	120	10	NA - Gasoline	No				
4	Off-Highway Trucks	250	4	Tier 4 (Final)	No				
4	Tractors/Loaders/Backhoes	500	2	Tier 3	Yes				
4	Rubber Tired Dozers	750	1	Tier 4 (Final)	No				
4	Other General Industrial Equipment	250	1	Tier 4 (Final)	No				
4	Generator	50	1	Tier 3	No				
5	Other Material Handling Equipment	120	10	NA - Gasoline	No				
Phase	Equipment Type	Horsepower	Quantity	Engine Tier	DPF Required?				
5	Off-Highway Trucks	250	4	Tier 4 (Final)	No				
5	Cranes	250	4	Tier 4 (Interim)	No				
5	Other General Industrial Equipment	250	1	Tier 4 (Final)	No				
5	Welders	50	6	Tier 4 (Final)	No				
5	Air Compressors	50	1	Tier 3	Yes				
5	Pressure Washers	50	1	Tier 4 (Final)	No				
5	Generator	50	1	Tier 3	No				
5	Rubber Tired Dozers	750	1	Tier 4 (Final)	No				
6	Other Material Handling Equipment	120	10	NA - Gasoline	No				
6	Off-Highway Trucks	250	4	Tier 4 (Final)	No				

Adopted Mitigation Measures						Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
6	Tractors/Loaders/Backhoes	500	1	Tier 3	Yes				
6	Rubber Tired Dozers	750	1	Tier 4 (Final)	No				
6	Generator	50	1	Tier 3	No				
8	Trenchers	175	1	Tier 3	No				
8	Other Material Handling Equipment	120	3	NA - Gasoline	No				
8	Off-Highway Trucks	250	4	Tier 4 (Final)	No				
8	Graders	250	1	Tier 3	Yes				
Phase	Equipment Type	Horsepower	Quantity	Engine Tier	DPF Required?				
<i>Area Work Phases</i>									
3	Other Material Handling Equipment	120	4	NA - Gasoline	No				
3	Off-Highway Trucks	250	1	Tier 4 (Final)	No				
3	Bore/Drill Rigs	120	1	Tier 3	Yes				
3	Tractors/Loaders/Backhoes	500	1	Tier 3	Yes				
3	Cranes	250	2	Tier 4 (Interim)	No				
3	Welders	50	2	Tier 4 (Final)	No				
3	Air Compressors	50	1	Tier 3	Yes				
7	Other Material Handling Equipment	120	3	NA - Gasoline	No				
7	Off-Highway Trucks	250	5	Tier 4 (Final)	No				
7	Tractors/Loaders/Backhoes	500	1	Tier 3	Yes				
7	Cranes	250	1	Tier 4 (Interim)	No				

Adopted Mitigation Measures						Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
7	Welders	50	3	Tier 4 (Final)	No				
7	Air Compressors	50	2	Tier 3	Yes				

BIOLOGICAL RESOURCES

Mitigation Measure M-BI-1a: San Francisco Garter Snake and California Red-Legged Frog Protection Measures

To avoid and minimize potential impacts on California red-legged frog and San Francisco garter snake during construction, the following measures shall be implemented:

- Only biologists approved by the USFWS shall participate in the capture, handling, or relocation of listed species. Pre-construction surveys shall be completed within 2 weeks prior to construction.
- Before the start of construction, a qualified biologist shall conduct an environmental awareness training session for all construction workers. Environmental awareness training may be provided by recorded video or via webinar. The training shall be repeated as new workers join the project. The training shall include a description of California red-legged frog and San Francisco garter snake (including photographs and their habitats), as well as other species that have the potential to be impacted by the project; general measures—as they relate to proposed project activities—that shall be implemented to conserve these species; penalties for non-compliance; and the limits of the construction work area. Construction workers shall sign a log indicating that they have received this training. No work (including material staging, fence installation, parking, excavation, or driving) shall be performed by individuals who have not received this training.
- A qualified biologist shall be present on site during all project activities at the Cañada Road segment and during vegetation clearing and grading activities from station 47+00 to the north end of

Project Sponsor biologist(s) and/or designee(s).

Up to 1 month prior to the start-of construction and throughout construction and post-construction activities.

Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.

Considered complete after pre-construction, construction, and post-construction activities have ended.

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
the Bunker Hill segment that is closest to San Mateo Creek. The biological monitor shall have the authority to stop any action that may result in take of listed species or unanticipated impacts on their habitats, provided that it does not risk the safety of the construction crews or the public. • Before the start of work, a USFWS-approved biologist shall identify acceptable locations to which California red-legged frog may be relocated if the species is encountered in a project work location. • Each morning before the start of work at the Cañada Road segment, a biological monitor shall inspect proposed project work locations—including those for staged materials and equipment, excavations, and fencing—to verify that no listed species are present within designated work areas. • Before moving vehicles and equipment that have been parked on site for more than 30 minutes, operators at the Cañada Road segment shall check beneath these vehicles/equipment and notify the biological monitor if any reptile or amphibian is observed. • Before the start of any ground-disturbing activities at the Cañada Road segment, ground-level vegetation that may provide cover for California red-legged frog and San Francisco garter snake shall be removed from excavation areas, including trench and HDD work locations. Immediately before removal, the biological monitor shall visually survey the area. Vegetation from station 125+00 to station 140+00 shall be cut using hand tools (including weed whackers and chain saws), and loose vegetation shall be removed to increase visibility. The biological monitor shall then visually survey the location a second time to verify that no listed species are present. • Vegetation cleared from construction locations along the Cañada Road segment, from station 125+00 to station 140+00, shall be loaded into containers. On-site chipping may be allowed, subject to				

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
approval by the landowner. No cleared vegetation in this area shall be stored on site, unless in a container.				
• All rodent burrows, soil crevices, and other potential subterranean retreats between stations 125+00 and 140+00 at the Cañada Road segment shall be inspected for the presence of California red-legged frog and San Francisco garter snake. After inspection, a USFWS-approved biologist shall excavate burrows, soil crevices, and other potential subterranean retreats by hand—or as otherwise directed by the USFWS—to verify that no California red-legged frogs or San Francisco garter snakes are present. Burrow excavation shall take place between April 1 and October 15. • At least 30 days prior to commencement of project activities, a Wildlife Exclusion Plan for the Cañada Road segment shall be submitted to the SFPUC for review. • As detailed in the Wildlife Exclusion Plan, temporary wildlife exclusion fencing shall be installed within San Francisco garter snake habitat—as determined by the PG&E biologist—along the edge of the Cañada Road segment construction work areas and access roads. The fencing, which can be made of wood, geotextile fabric, or other durable material, shall be a minimum of 3 feet in height and shall be buried at least 6 inches underground. In areas where this is infeasible, (such as on asphalt), alternative measures will be developed. Gates shall be installed to allow vehicles to enter from access roads. These gates shall be kept closed to the extent practicable during construction activities, and they shall be closed at the end of each workday. Exit funnels shall be installed every 100 feet, or where appropriate (determined by the PG&E biologist), to allow small vertebrates to leave work locations unharmed. A qualified biological monitor shall be on site during installation of the fencing to ensure that the fencing is installed as required. Relocation of federally listed species can only be done if authorized by the				

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
USFWS. Relocation of state-listed species can only be done if authorized by the CDFW. Once exclusion fencing is in place, it shall be maintained by PG&E via their contractor until all work within the enclosure has been completed. During construction activities, the biological monitor shall inspect the exclusion fencing each morning before the start of work and again at the end of each workday. Any damaged areas shall be reported to PG&E and shall be repaired by the contractor as soon as practicable. After construction is complete, the exclusion fencing shall be removed under supervision of a qualified biologist. - Vegetation removal within San Francisco garter snake habitat along the Cañada Road segment shall take place between June 1 and October 15, to the extent feasible, so that any San Francisco garter snakes present can find a suitable alternative winter retreat before the onset of cold-weather conditions. Once these activities are completed, temporary wildlife exclusion fencing shall be installed around construction work areas and shall be maintained to prevent the re-entry of California red-legged frog and San Francisco garter snake. - Prior to dewatering trenches along the Cañada Road segment, these locations shall be visually surveyed by the biological monitor for the presence of San Francisco garter snake and California red-legged frog adults, egg masses, and tadpoles. Pumps used for dewatering shall be equipped with a mesh screen to help prevent the entrainment of California red-legged frog and San Francisco garter snake. Dewatering shall not take place during the California red-legged frog breeding season (December through March) if egg masses are present in aquatic habitats. Thirty days prior to commencement of project activities, PG&E shall submit a plan detailing the water-diversion method to the SFPUC for review. - The limits of the access roads shall be staked and flagged or fenced				

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
so that vehicle traffic is confined to the designated areas. - Speed limit signs shall be posted along the access roads within the entrances to designated construction work areas. All vehicles must adhere to a 15 mile-per-hour (mph) speed limit on access roads within the proposed project areas, or as otherwise required through agency or SFPUC permits. - Signs shall be posted notifying all personnel of the potential presence of sensitive species on the access roads for the Cañada Road segment. - The total area of construction activities shall be limited to the minimum necessary within the designated construction work areas to achieve the goal of the proposed project. All environmentally sensitive areas outside of designated construction work areas and access routes shall be avoided. - All steep-walled excavations more than 2 feet deep shall be either covered at the end of each work day or equipped with one or more escape ramps positioned at no greater than a 45-degree angle, so that wildlife will not become entrapped. All open excavations shall be inspected for wildlife at the beginning of each day, before the start of work. Other entrapment hazards that are shallower than 2 feet will be identified by the biological monitor, and measures will be taken to prevent entrapment (i.e., installation of covers or placement of escape methods, such as a branched object). - All fueling and maintenance of vehicles and other equipment shall occur at least 100 feet from any riparian habitat or water body, unless a shorter distance is agreed to by the regulatory agencies or SFPUC due to specific site conditions. Before the start of project construction, PG&E shall develop a prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and the appropriate measures to take if a spill				

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
occurs.				
- Erosion-control materials that do not pose an entrapment hazard to reptiles and amphibians shall be used. Plastic monofilament netting (e.g., matting, fiber rolls, wattles, silt fence backing) shall not be used. - Following the completion of construction activities, areas with listed species habitat that are subject to ground disturbance will be restored pursuant to the Vegetation Restoration Plan identified in Mitigation Measure M-BI-1f, Habitat Protection Measures. - If a San Francisco garter snake is found in a work location during proposed project activities, the individual shall be allowed to move out of the area on its own volition, as determined and monitored by the biological monitor. - If a California red-legged frog is found inside an exclusion fence or in another work location where it may be harmed, it shall be moved to a previously identified relocation area under the procedure outlined in permits obtained from regulatory agencies. Only USFWS-approved biologists shall be allowed to handle, transport, and relocate California red-legged frogs. - The USFWS-approved biologist shall ensure that any California red-legged frogs are relocated to an area where they are not imperiled by predators or other dangers.				
<i>Mitigation Measure M-BI-1b: Bat Roost Surveys and Avoidance and Minimization Measures</i> The Crystal Springs and Cañada Road segments contain trees and habitat that are potentially suitable for use as daytime roosting and foraging for pallid bats. To avoid potentially adverse impacts on pallid bats, trees shall be evaluated for their potential to serve as maternity or daytime roosts. A qualified biologist (i.e., one familiar with the identification of bats and	Project Sponsor biologist(s) and/or designee(s).	Spring and summer prior to the start of construction and during tree removal activities	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project	Considered complete after pre-construction and vegetation removal during construction have ended.

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
signs of bats) shall identify trees that might be potential day or maternity roosts. Prior to start of construction, a qualified biologist shall perform a survey for roosting bats or maternity colonies at the proposed project sites. Surveys shall focus on trees slated for removal and shall evaluate the probability for trees to host roosting bats. If day-roosting bats are found or evidence of use by bats is present, the following procedures shall be implemented before felling the tree: - Trees shall be removed under warm conditions. Noise and vibrations—including running a chainsaw and making shallow cuts in the trunk (where bark has been), and striking the tree base with fallen limbs or tools, such as hammers—shall be created on the tree itself. Disturbance shall be near-continuous for 10 minutes, and then another 10 minutes shall pass before the tree is felled. When cutting sections of the trunk, if any hollows or cavities (such as woodpecker holes) are discovered, they shall be carefully checked for the presence of bats. Cutting shall be done slowly and carefully at all times. If possible, the trunk shall be sectioned near cavities to focus noise and vibrations, and hollows shall be opened by sectioning off a side. - Additional measures may include monitoring trees, excluding bats from a tree until it is removed and/or restricting the timing of tree removal, and using a construction buffer to avoid disturbance of breeding colonies or disturbance of young before they are able to fly (for pallid bats, this period is between April and August).			Sponsor compliance.	
Mitigation Measure M-BI-1c: Pre-construction Bird Surveys Nesting birds and their nests shall be protected during construction by implementation of the following measures: Construction activities, including vegetation and tree removal, shall be conducted outside of the bird nesting season (February 1 to	Project Sponsor biologist(s) and /or designee(s).	During construction between February 1 and August 30.	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project	Considered complete after pre-construction and construction activities have ended.

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
August 30), to the extent feasible.			Sponsor compliance.	
• If construction will occur during the bird nesting season, a qualified wildlife biologist shall conduct pre-construction surveys within 7 days of the start of construction or after any construction breaks of 14 days or more to identify active nests. A nest is defined to be active for raptors if a pair of raptors is displaying reproductive behavior (i.e., courting) at the nest and/or if the nest contains eggs or chicks. Surveys shall be conducted for the nesting birds and suitable habitat within 100 feet of the proposed project sites to locate any active passerine nests, and within 300 feet of the proposed project sites to locate any active raptor nests. • If active nests are located during the pre-construction bird nesting survey, the wildlife biologist shall evaluate whether the schedule of construction activities could affect the active nest and the following measures shall be implemented based on their determination: ○ Construction determined not likely to affect the active nest may proceed without restriction; however, the wildlife biologist shall regularly monitor the nest to confirm that there is no adverse effect, and may revise their determination at any time during the nesting season. ○ If construction may affect the active nest, the biologist shall establish a no-disturbance buffer. The biologist shall determine the appropriate buffer to be in compliance with the Migratory Bird Treaty Act and Fish and Game Code 3503, taking into account the species involved, the presence of any obstruction—such as a building—within line-of-sight between the nest and construction, and the level of project and ambient activity (i.e., adjacent to a road or active trail). No-disturbance buffers for passerines typically vary from 25 feet and greater, and for raptors from 300 feet and greater. Active nests shall be monitored and exclusion buffer sizes increased if the				

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
monitoring biologist determines this is necessary based on disturbance behavior exhibited by nesting birds in proximity to project construction. For bird species that are federally and/or state-listed sensitive species (i.e., threatened, endangered, fully protected, or species of special concern), a PG&E representative, supported by the wildlife biologist, shall consult with the USFWS and/or CDFW regarding nest buffers. - Inactive passerine nests may be removed at any time, but inactive raptor nests shall not be removed unless approved by the USFWS and/or CDFW. - Removing or relocating active nests shall be coordinated by the PG&E representative with the USFWS/and or CDFW, as appropriate, given the nests that are found at the site. - Any birds that begin nesting within the proposed project areas and survey buffers amid construction activities are assumed to be habituated to construction-related or similar noise and disturbance levels, and no work exclusion zones shall be established around active nests in these cases.				
Mitigation Measure M-BI-1d: San Francisco Dusky-footed Woodrat Prior to and during construction, before any clearing of, or work within, riparian, oak woodland, or coyote brush scrub habitat, a qualified biologist shall conduct a survey for San Francisco dusky-footed woodrat nests no more than 30 days prior to the start of construction in that area. Where nests are found, the following procedures shall be observed: If practicable, exclusion fencing shall be installed and a buffer of at least several feet around nests shall be maintained, and moving or bumping the nests—or logs or branches on which the nests rest—shall be avoided.	Project Sponsor biologist(s) and /or designee(s).	Within 30 days prior to construction.	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.	Considered complete after pre-construction and construction activities have ended.

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
- If avoidance of nests is not practicable, CDFW shall approve any relocation and post monitoring plan. This plan shall include the following, although CDFW could require additional measures: - Woodrat houses shall be live-trapped each night until the project is complete. - If no woodrat are captured at a given house, the house will be slowly dismantled by hand so that it is not reoccupied. - Captured woodrat will be contained in shaded traps while the stick house is dismantled and the artificial shelter is installed. Each artificial shelter will be installed within approximately 50 to 200 feet of the capture location. Only occupied woodrat houses will be replaced with an artificial shelter, however all stick houses will be disassembled to prevent woodrat occupation of unused houses. - At the request of CDFW, remote cameras will be used to monitor five of the artificial shelters for at least one week; if the site is secure, the cameras may be left for approximately 30 days. - A post-construction survey will be made at approximately one month following the trapping effort to determine activity at each artificial shelter. Within 60 days of the first post-construction survey, a report will be prepared for the ERO and CDFW in standard CDFW format that details the results of the live-trapping and initial monitoring of the artificial shelters, including results from the camera monitoring.				
Mitigation Measure M-BI-1e: Fragrant Fritillary Protection Measures A qualified biologist shall conduct surveys for fragrant fritillary within suitable habitat of the Cañada Road and Bunker Hill segments in the same year prior to construction and during the appropriate blooming	Project Sponsor biologist(s) and/or designee(s).	During pre-construction, construction, and post-construction	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning	Considered complete after pre-construction, construction, and post-construction

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
period, to ensure that any plants that were not blooming during previous surveys are identified, as well as to obtain specific locations of previously identified plants. Prior to surface-disturbing activity, the locations of individuals within the construction work area shall be flagged and documented in the field using a sub-meter accuracy global positioning system (GPS) unit. The extent of the colonies shall be staked and marked in the field, and their boundaries collected using a sub-meter accuracy GPS. Bulbs and seeds shall be collected by hand prior to mechanical topsoil salvage. Biologists shall record the approximate average depth at which bulbs are collected so that they can be replanted at the same average depth during site restoration. Topsoil salvaged from these areas shall be stored separately from other materials. Any bulbs exposed during the stripping of topsoil, as described in M-BI-1f, Habitat Protection Measures, shall be collected and stored until construction is complete. After collection, bulbs and seeds shall be stored in a cool and dry location. Colonies removed during construction shall be restored. The restoration area for a colony shall be the extent of the removed colony, unless otherwise specified through agreement between the SFPUC and PG&E prior to restoration. If bulbs and seeds cannot be replanted by November 1, they will be properly stored and replanted the following fall, September 1 to October 31. The Vegetation Restoration Plan, as required in Mitigation Measure M-BI-1f, shall contain the following specific monitoring and performance criteria for the restoration of fragrant fritillary: • Areas replanted with fragrant fritillary bulbs and seeds shall be monitored for a minimum period of 5 years. • Flowering fragrant fritillary shall be censused annually within the work area and an adjacent reference population. The number of detectable fragrant fritillary in leaf and/or flower is expected to vary in the work area and in the reference site from year to year,		activities.	Department responsible for monitoring Project Sponsor compliance.	activities have ended.
				Monitoring shall be conducted post-construction for a minimum of 5 years.

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
depending on precipitation, herbivory and other ecological variables. - Restoration will be considered to have been a success if, in addition to success criteria identified for the overall vegetation restoration area, for the final period of 2 years of monitoring, the number of individual fragrant fritillary in the restoration area is at least 70 percent of the number censused in the construction work area during the 2015 blooming season (350 plants), as adjusted annually based on reference site plant counts. The numbers of fragrant fritillary counted in the reference population each year will be compared to the 2015 pre-construction reference population number to adjust the yearly plant targets. For example, if only half of the plants known to occur in the undisturbed reference population are present in any given year, the target number of plants for the reestablished population in the work area will be adjusted (lowered) proportionately. - If the number of plants does not reach the performance criterion or if data from earlier years suggest the site is not on a trajectory to meet this success criterion, then adaptive management actions will be developed and supplemental activities may be performed. These could include supplemental salvage and transplantation, seed collection and plant propagation (on site only), or seed collection and direct sowing.				

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
Mitigation Measure M-BI-1f: Habitat Protection Measures				
The following general habitat protection measures shall be implemented for the proposed project: - Prior to construction, PG&E shall coordinate with the SFPUC to prepare and equipment and material arriving on site is clean and free of soils and plant material, and will include tire-wash requirements for equipment that has been driven off-road prior to arriving at the proposed project sites. - Riparian and other wetland areas within the proposed project sites shall be denoted as environmentally sensitive areas and will be avoided during construction, to the extent practicable, or as otherwise directed by the regulatory agencies. - Special-status plant colonies that have been identified for avoidance shall be fenced to prevent encroachment by construction activities. - Crystal Springs lessingia individuals that cannot be avoided in areas to be cleared or grubbed shall have seed or vegetative material containing seed collected at the appropriate time, to be stored and distributed on top of the salvaged topsoil when it is redistributed.	Project Sponsor biologist(s) and/or designee(s)	During pre-construction, construction and post-construction activities	Project Sponsor shall be responsible for periodic <u>quarterly</u> reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.	Considered completed after pre-construction, construction and post-construction activities required by mitigation measure have <u>been completed as specified</u> ended .

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
- The topsoil from trenching through grasslands, and other plant communities with predominantly native plant species, shall be salvaged and stockpiled separately in upland construction work areas. Topsoil shall be stored in such a way that it is protected from invasive propagules, but does not overheat and kill off the native plant propagules. This shall include placing the stored topsoil where it is not in contact with non-native grassland soil and protecting it with weed-free straw mulch or other suitable cover. Following construction, the salvaged topsoil will be spread over the disturbed area from which it was removed, and the area will be graded to match the pre-construction natural grade. Once the salvaged topsoil has been spread and the area returned to the pre-existing topography, the area will be revegetated with locally collected (where possible) native grassland species. If topsoil in grasslands has a substantial population of non-native plant species, as identified in the Vegetation Restoration Plan, it may be buried below the subsoil during backfill, and the serpentine soils from deeper in the trench placed on the surface. - Existing topography shall be restored to pre-project conditions to the extent possible. For herbaceous and grass-dominated riparian areas, it is expected that revegetation will naturally occur once the topography is restored using topsoil salvage requirements. Riparian areas will be revegetated with an appropriate mix of native plants, including species such as creeping wild rye, meadow barley, blue wild rye, arroyo willow, California bay, and coast live oak, as shall be detailed in the Vegetation Restoration Plan. - Prior to the start of construction, PG&E shall develop a <u>two-part</u> Vegetation Restoration Plan in coordination with the SFPUC and the appropriate resource agencies <u>for on-site vegetation restoration (Vegetation Restoration Plan, Part 1)</u>. PG&E shall submit the <u>Vegetation Restoration Plan, Part 1</u> to CDFW and SFPUC for review and approval <u>and will be responsible for ensuring that the plans are implemented under the guidance of a qualified biologist.</u>				

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
• <u>Tree replanting, under Vegetation Restoration Plan, Part 2 (detailed below) shall conform to the following priorities: (1) replacement trees shall first be planted on-site in the ROW on the SFPUC Peninsula Watershed, to the extent consistent with the SFPUC's Peninsula Watershed Management Plan, as determined by SFPUC's Natural Resources Land Management Division biologist; (2) any replacement trees that exceed the capacity of the Peninsula Watershed, as determined by SFPUC's Natural Resources Land Management Division biologist, shall be replanted offsite as detailed below, under Vegetation Restoration Plan, Part 2.</u> • The Vegetation Restoration Plan, <u>Part 1</u> shall include the following measures: ○ Mitigation <u>under the Vegetation Restoration Plan, Part 1</u> shall consist of a minimum 1:1 ratio of on-site restoration of sensitive habitats and plant communities, including needlegrass grassland, serpentine grassland, riparian areas, coast live oak woodland, and shrublands. Tree replacement ratios shall be 3:1 for native oak trees. ○ <u>Vegetation Restoration Plan, Part 1</u> The plan will shall identify specific areas of topsoil to be salvaged during construction for re-spreading, as well as areas where topsoil carries a greater percentage of non-native species; in the latter areas, topsoil may be buried under fresher material. PG&E shall develop seed mixes for each plant community, consisting of locally collected native species. Following construction, the sites will be prepared and stabilized with coir or weed-free rice straw (or jute netting material in steeper areas), and vegetation will be restored using the defined seed mixes appropriate to each area. ○ Additional plantings of shrubs and tree propagules will be completed in the appropriate plant communities during the				

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
fall or winter immediately following construction. Replacement shall occur within the temporary construction work spaces and adjacent areas, as determined in coordination with the SFPUC Natural Resources and Lands Management Division and other applicable resource agencies. - Non-native trees, such as Monterey pine, Monterey cypress, and eucalyptus, shall be replaced with native tree species if they meet the definition of "Significant" trees in the San Mateo County Significant Tree Ordinance (see Impact BI 1e). - To minimize the temporal loss of trees and shrubs, when site conditions permit, a variety of native trees and shrubs with different growth rates shall be planted to ensure that nest and roost sites will be available in the short term for birds and bats. <u>However, due to the risk of the spread of <i>Phytophthora</i>³, and other soilborne diseases through introduction of plants grown in soil offsite, replanting on the Peninsula Watershed is limited to the use of seeds. The use of seedlings and plants of mixed sizes to minimize temporal loss of oak woodland habitat at off-site restoration areas is addressed below under Vegetation Restoration Plan, Part 2.</u> PG&E will be responsible for ensuring that the plan is implemented under the guidance of a qualified biologist. The <u>Vegetation Plan Part 1 plan</u> shall be designed such that it meets the following success criteria, or other equally protective success criteria, as approved by the resource agencies: - The restored sites <u>are</u> is composed of a mix of appropriate native species appropriate for each site, as outlined in the <u>Vegetation Restoration Plan, Part 1.</u>				

³ a fungal plant infestation responsible for Sudden Oak Death and other plant diseases

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
○ Cover of non-native invasive weed species shall not exceed 20 percent within serpentine grassland areas. This criterion may be revised, if approved by CDFW, if it is deemed that achieving 20 percent cover is not reasonable due to the presence of high levels of non-native invasive weeds adjacent to the project area. ○ The restored sites <u>under Vegetation Restoration Plan, Part 1</u> has <u>have</u> at least 75 percent of the preconstruction baseline cover. ○ After revegetation and restoration are completed, monitoring <u>of vegetation replanted under Vegetation Restoration Plan, Part 1</u> shall be conducted by a restoration specialist or biologist for a minimum of 5 years. The sponsor can choose to continue monitoring for an additional year for each year of below-average precipitation during the monitoring period. If by the end of monitoring the approximately 5.8 acres of serpentine grasslands temporarily disturbed by construction fails to meet the restoration success criteria, then PG&E shall provide for additional off-site mitigation at a ratio of two acres for each acre of serpentine grassland that fails to achieve success criteria, unless otherwise approved by the applicable regulatory agencies. Serpentine grasslands shall be evaluated as separate units based on their location along a given pipeline segment (i.e., Bunker Hill), or obvious breaks in the continuity or composition of the serpentine grassland communities within a given pipeline segment. Serpentine units for the purposes of monitoring the success criteria shall be identified in the Vegetation Restoration Plan. ○ Off-site mitigation <u>under Vegetation Restoration Plant, Part 1</u> could include funding of serpentine grassland restoration, such as through the Presidio Trust Stewardship Program in San Francisco.⁴ Funding would be tied to the number of acres				Monitoring of replanting <u>under Vegetation Restoration Plan, Part 1</u> shall be conducted post-construction for a minimum of 5 years <u>after the required Part 1 replanting has been completed.</u>

⁴ National Park Service and Presidio of San Francisco. 2001. Vegetation Management Plan and Environmental Assessment.

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
of serpentine grasslands restored through actions that may include tree and brush removal, exotic species management, grassland cover management (i.e., mowing, grazing, rotational tarping, and reseeded), and monitoring.				
<u>Vegetation Restoration Plan, Part 2. For any required replanting that exceeds the tree replanting capacity of the SFPUC Peninsula Watershed, PG&E shall be responsible for restoration of former oak woodland by planting oaks and other native trees, in a restoration area or areas in Wunderlich County Park or at another appropriate off-site restoration location in eastern San Mateo County to be identified by the Project Sponsor in consultation with and approval by CDFW. Selection of the woodland replacement or restoration site(s), determination of the appropriate density for replanting, and implementation of the restoration/ replanting program shall be as directed by CDFW and shall be supervised by a qualified arborist, horticulturist, landscape architect or landscape contractor. Restoration/planting sites shall be suitable for restoration of oak woodland comparable to that removed, based on slope, soil type, exposure, drainage and other suitability factors as determined by the restoration specialist. The restoration effort shall be planned, implemented, funded and maintained by the Project Sponsor in consultation with, and as approved, by CDFW and the land manager of the proposed restoration site, and shall be prepared and implemented as follows:</u> ○ <u>PG&E shall prepare a Vegetation Restoration Plan, Part 2 (Oak Woodland Restoration Plan), consistent with the requirements of tree replanting ratios set forth in mitigation measures BI-1f and B 5, for planting of the required oak and other native woodland species and for replacement of Significant and Heritage trees, as follows:</u> ○ <u>Tree replacement ratios shall be 3:1 for native oak trees; and</u> ○ <u>Minimum 1:1 ratio of restoration of sensitive habitats</u>	<u>PG&E, in consultation with CDFW, SFPUC and the land manager at the proposed restoration site.</u>	<u>Compliant plan shall be submitted to CDFW, SFPUC and the land manager no later than July 31, 2018 and on-the-ground implementation shall be initiated within 18 months of tree removal.</u>	<u>PG&E shall report to Planning Department and CDFW; Planning Department is responsible for overseeing compliance</u>	<u>PG&E shall report progress at least quarterly, and shall provide Planning with copies of all plans and associated documentation</u>

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
<u>and plant communities including, riparian areas, coast live oak woodland, and shrublands not replaced under Vegetation Restoration Plan, Part 1; and</u> ○ <u>Each native tree that meets the definition of “Significant” tree or “Heritage” tree in the San Mateo County Significant Tree Ordinance (see FMND Impact BI-5). shall be replaced at a 3:1 ratio; and</u> ○ <u>Non-native trees, such as Monterey pine, Monterey cypress, and eucalyptus, shall be replaced with 1:1 with native tree species</u> ○ <u>Alternatively, an acreage metric may be considered to satisfy the tree replanting requirements set forth in mitigation measures BI-1f and B 5. This alternative acreage metric for tree replacement shall only be used if reviewed and approved by CDFW and based on upon site specific circumstances. Acreage would be based on area needed for replacement of lost oak woodland habitat with restored high quality woodland habitat, at similar tree densities to the habitat(s) removed, and at a ratio of 3 acres restored for each 1 acre of habitat lost through tree removal.</u> ○ <u>CDFW shall review PG&E’s arborist reports to determine final number of oaks and other native trees, and the final number of significant and heritage trees of any variety that were removed and that require replacement under the criteria set forth in the FMND.</u> ○ <u>The primary focus of the Vegetation Restoration Plan, Part 2 shall be native tree planting and oak woodland restoration off-site, to include any trees needed to meet the require replanting ratios that cannot be accommodated on the Peninsula Watershed. This plan may include limited tree replanting on</u>				

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
<u>the Peninsula Watershed to the extent consistent with SFPUC's Natural Resources Land Management Division (NRLMD) watershed management goals, and as determined by the SFPUC biologist.</u> ○ <u>Vegetation restoration may be achieved through a combination of active and passive methods. "Passive" restoration would begin with removal of invasive non-native trees and from the restoration site, followed by active fostering of naturally-recruited oaks and other oak woodland species through measures such as acorn planting, irrigation, and installation of tree protection. The success of such efforts shall be monitored by a qualified biologist to meet the tree restoration ratios specified in this measure and shall be augmented annually with additional adaptive management measures restoration does not proceed at a rate expected to achieve restoration targets within the seven-year monitoring period.</u> ○ <u>Replanting/restoration under the plan shall include an appropriate range, mix and density of native species present in healthy native oak woodland at the restoration/ replanting site, as determined by San Mateo County Parks or other restoration site land manager in consultation with CDFW. Replanting on the Peninsula Watershed, and potentially at the off-site location, is limited to the use of seeds due to the risk of <i>Phytophthora</i> and other soilborne diseases. However, to minimize the temporal loss of trees and shrubs, a variety of native trees and shrubs with different growth rates shall be planted at the offsite restoration site(s), as site conditions permit, to ensure that nest and roost sites will be available in the short term for birds and bats. Consistent with the County's significant and Heritage Tree ordinances, seedlings and larger</u>				

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
<u>boxed plants shall be included in the plant mix, as feasible, to reduce the temporal duration of the loss of habitat, and improve the replanting success rate. To this end, The Project Sponsor shall make a good faith effort to procure nursery container stock cultivated using best management practices for control of <i>Phytophthora</i> and other soilborne diseases⁵. At the discretion of the land manager at the offsite restoration site(s), seed planting may be used in part and/or in lieu of planting of nursery stock, if "clean" nursery stock cannot be assured.</u> ○ <u>Appropriate planting densities may vary depending on the restoration site, but the restoration goal is successful restoration at a density of approximately 90 oak trees per acre for oak woodland and 40 oaks per acre for oak savannah.</u> ○ <u>To ensure a successful revegetation effort, all plantings shall be irrigated as necessary for a minimum of three years and monitored and maintained as necessary for a minimum of 7 years with a minimum of 4 consecutive years (4 growing seasons) of monitoring after the removal of irrigation, with the goal of a minimum of 80 percent survival of all plantings, at the end of the minimum monitoring period. If the restoration has not met these goals after seven years, PG&E shall be responsible for replacement planting, additional watering, weeding, invasive exotic eradication, or other practice, to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements for 3 years after planting.</u> ○ <u>The Vegetation Restoration Plan Part 2 shall detail the following:</u> • <u>Proposed native species mixes and proportions of plant</u>				

⁵ <http://phytosphere.com/BMPsnursery/Index.htm>

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
<u>sizes;</u> <u>Site preparation procedures for removal of non-native invasive species in the replanting area, and other site preparation as needed to accomplish effective restoration;</u> <u>Procedures and mechanisms for ongoing invasive species eradication and control and protection from herbivores;</u> <u>Irrigation plan and schedule, for at least the first three years following planting; and</u> <u>Monitoring schedule, and procedures and timing for identification and replacement of failed replanting.</u> <u>A plan that meets these specifications shall be submitted to CDFW and the land manager at the off-site restoration site no later than August 30, 2018. The Oak Woodland Restoration Plan shall be reviewed and must have the approval, in advance of implementation, of CDFW and San Mateo County Parks, and (with respect to any planting proposed on SFPUC land) of SFPUC, and must be fully implemented within 10 years of the project's initial tree removals (that is, by 2026).</u>				
<u>If for any reason these planned actions are determined to be infeasible to the extent currently planned, and Project Sponsor's full tree planting obligation cannot be attained at Wunderlich County Park, Project Sponsor shall identify and plan for restoration of another a restoration site within eastern San Mateo County where the measure can be implemented, within six months of the date that the Wunderlich or SFPUC options are determined infeasible.</u>	<u>Project Sponsor to identify alternative site for off-site planting if San Mateo County Parks determines that plan is infeasible at Wunderlich</u>	<u>Identify alternative site by March 2019 if MOA not executed by December 30, 2018 due to infeasibility of planting plan at Wunderlich</u>	<u>Project Sponsor shall provide Planning Department with documentation of good faith effort to execute MOA; and with plan for alternative site</u>	<u>MOA documentation to Planning by December 30, 2018; plan for new site to Planning by March 31, 2019</u>
<u>In the event that, after good-faith effort by Project Sponsor to meet the mitigation requirements above through a plan for restoration at the Wunderlich site or another site in eastern San Mateo County, CDFW determines that the restoration as described above is infeasible in</u>	<u>If replanting planning efforts are unsuccessful, Project Sponsor to</u>	<u>Funding proposal to CDFW by April 30, 2019; payment into fund by June 30,</u>	<u>Project Sponsor shall provide a narrative report of restoration planning efforts; and a</u>	<u>Documentation to Planning no later than May 30, 2019; Documentation of</u>

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
<u>eastern San Mateo County, Project Sponsor may alternatively compensate for impacts on oak woodlands in whole or in part through a contribution to the Oak Woodlands Conservation Fund as established under subdivision (a) of Section 1363 of the Fish and Game Code; or by purchase of high quality oak woodland and establishment of a conservation easement, and donation of this land to the San Mateo County parks or other oak woodland land manager. The amount of the fee/ purchase shall be calculated based on:</u> <u>o The value of 5.5 acres of land with high quality preserved oak woodland habitat in western San Mateo County; or</u> <u>o The value of 16.5 acres of land in San Mateo County suitable for oak woodland restoration (to accommodate trees removed at 3: 1 ratio), plus the estimated cost of that restoration; or</u> <u>o Another appropriate metric developed by a qualified restoration biologist in collaboration with the California Department of Fish and Game. This alternate compensation calculation shall reflect differences in habitat quality, and may consider the cost of lands with comparable habitat (fee title or easement) in nearby areas and shall be subject to CDFW approval.</u> <u>Tree replanting on the Peninsula Watershed shall begin by January 15, 2019, or within 90 days of the conclusion of construction if construction has not been completed by January 15. Off-site restoration work, including initial planting of acorns, shall begin as soon as all necessary regulatory approvals have been received, but no later than January 15, 2019. In recognition of the temporal aspect/context of impacts to habitat and the effect of delaying compensatory mitigation on habitat functionality, the compensation ratio requirements shall be increased to 4:1 for tree removals that do not begin to receive mitigation within 18 to 24 months (as determined by CDFW) after initial tree removal; taking into account the staggered dates of tree removal on the successively-constructed Crystal Springs, Bunker Hill Road and Canada Road</u>	<u>document good faith effort and develop mitigation measure-compliant funding proposal that is satisfactory to CDFW.</u> <u>Project sponsor shall consult with CDFW to arrive at the appropriate quantity of tree replanting, acreage, and/or funding to comply with the measure.</u>	<u>2019</u> <u>By March 30, 2019 if initial tree replanting on the watershed has not begun by January 2019, or within 90 days of the completion of construction, or if off-site replanting has not begun by</u>	<u>copy of the compensatory funding proposal to Planning Department.</u> <u>Project sponsor shall provide planning with an accounting of agreed upon tree ratios, planting acreage and/or funding.</u>	<u>payment into qualified fund no later than July 30, 2019.</u> <u>By April 30, 2019</u>

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
<u>segments of the project and any regulatory delays, after the submission by PG&E to Planning and CDFW of a Vegetation Restoration Plan, Part 2 that meets or exceeds these mitigation requirements. Any increase in the tree planting requirement shall also be reflected in a comparable increase in required restoration acreage to accommodate the trees at an acceptable replanting density as determined by CDFW; and/or in the cost of compensatory mitigation, as detailed above, to reflect the larger number of trees.</u>		<u>January 15, 2019.</u>		
<i>Mitigation Measure M-BI-1g: Mission Blue Butterfly Protection Measures</i> The following protection measures shall be implemented for the Crystal Springs segment work area west of I-280: - Not more than 2 weeks prior to the onset of work activities (including equipment mobilization) and immediately prior to commencing work, a qualified biologist shall survey grassland habitat in the project area for Mission blue butterfly and its larval host plant. Host plants identified within the project boundaries shall be fenced or flagged and avoided during construction. - Temporary fencing shall be installed around the workspace perimeter, and for 100 feet along Golf Course Drive on each side of the workspace, to prevent equipment parking off the road. The fencing shall remain in place until the completion of construction adjacent to the lupine patches. - All workers shall receive educational awareness training about Mission blue butterfly, its food plants, and its habitat.	Project Sponsor biologist(s) and /or designee(s).	Within 2 weeks prior to construction.	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.	Considered complete after pre-construction and construction activities have ended.
<i>Mitigation Measure M-BI-3: Protection Measures for Jurisdictional Water Bodies and Riparian Areas.</i> The following measures shall be implemented during project design,	Project Sponsor is responsible for contractor	During pre-construction, construction, and post-construction	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding	Considered complete after pre-construction, construction, and

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
construction, and post-construction, as relevant: - Design and installation of pipeline spans and temporary bridges shall be such that the water flow (velocity and low-flow channel width) is not impaired. - Prior to construction, the construction work area shall be flagged or fenced to identify its limits within the stream. Vegetation shall not be removed or intentionally damaged beyond these limits. - Any materials placed in or adjacent to the stream that could be washed downstream shall be removed prior to the rainy season. - Equipment shall not be operated in jurisdictional areas without prior written approval of the relevant resource agencies. - Within 3 days following construction, all disturbed channels shall be restored to their original condition. - No construction shall occur outside of the dry season (April 15 through October 15), unless approved by a relevant resource agency, as appropriate. - The contractor shall stabilize exposed slopes within 3 days of completion of construction/installation activities. Erosion-control measures shall be installed adjacent to suitable aquatic habitat to prevent soil from eroding or falling into these areas.	compliance.	activities. Construction between April 15 and October 15.	compliance; Planning Department responsible for monitoring Project Sponsor compliance.	post-construction activities have ended.
Mitigation Measure M-BI-5: Pre-construction Tree Surveys and Tree Removal A qualified arborist shall conduct a pre-construction tree survey of the riparian and oak woodland areas, identifying each tree to species and providing diameter at breast height. Any tree removal, pruning, or work within the drip line of trees—other than in paved areas—will be reviewed	Project Sponsor arborist(s) and/or designee(s).	During pre-construction, construction, and post-construction activities.	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for	Considered complete after pre-construction, and post-construction activities have

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
and approved by a PG&E arborist or their designee. All trimming and removal shall be conducted by a PG&E arborist. Tree trimming and removal shall be minimized to what is required to implement the proposed project, and PG&E will evaluate the feasibility of further minimizing impacts on native trees through selective narrowing of construction work areas or other construction practices, and/or through a contractor incentive program to avoid trees. PG&E will clearly show Tree Protection Zones on project drawings. Any Significant or Heritage Trees, as defined in the San Mateo County Tree Ordinances, that cannot be avoided will be documented and replaced at a minimum 3:1 ratio. Tree replacement, maintenance, and monitoring requirements shall be included with the Vegetation Restoration Plan described in Mitigation Measure M-BI-1f, Habitat Protection Measures. The newly planted trees shall be monitored for a minimum of 7 years.			monitoring Project Sponsor compliance.	ended.

GEOLOGY AND SOILS

Mitigation Measure M-GE-3: Site Preparation

Areas that will receive fill shall be stripped of existing surface vegetation, organic topsoil, debris, and any other deleterious materials prior to over-excavation or placement of engineered fill. Any stripped organic materials or debris will not be reused as engineered fill.

Initial site grading shall include a reasonable search to locate soil disturbed by previous activity, undocumented fill soils, abandoned underground structures, and/or existing utilities that may exist within the areas of construction. Any loose or disturbed soil, void spaces made by burrowing animals, or undocumented fill shall be over-excavated to expose firm soil.

Project Sponsor is responsible for contractor compliance.

During construction activities.

Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.

Considered complete after construction activities have ended.

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
<i>Mitigation Measure M-GE-6: Unanticipated Discoveries for Paleontological Resources</i> If construction crews discover fossils or fossil-like material during excavation and/or earthmoving operations, all earthwork and other types of ground disturbance within 50 feet, or as recommended by the paleontologist, of the find shall stop immediately until a qualified paleontologist—as defined by the Society of Vertebrate Paleontology guidelines—can assess the nature and importance of the find. Based on the uniqueness of the find, the qualified paleontologist may record the find and allow work to continue, or recommend salvage and recovery of the fossil. If required, treatment for fossil remains may include preparation and recovery of fossil materials so that they can be housed in an appropriate museum or university collection, and may also include preparation of a report describing the finds. Fossil remains collected during monitoring and/or salvage shall be cleaned, repaired, sorted, cataloged, and deposited in a scientific institution with permanent paleontological collections, and a paleontological report shall be written. The paleontologist's recommendations shall be subject to review and approval by the ERO or designee.	Project Sponsor to retain appropriately qualified consultant to carry out monitoring and reporting.	During pre-construction and construction activities, including excavation and/or earthmoving operations.	ERO review and approval of paleontologist's recommendations. Project Sponsor's approved qualified paleontologist is responsible for monitoring contractor compliance; Planning Department responsible for monitoring Project Sponsor compliance.	Considered complete after construction activities have ended and final report accepted by ERO.

HYDROLOGY AND WATER QUALITY

<i>Mitigation Measure M-HY-1a: Trench Plugs</i> Trench plugs (1-cubic-foot burlap sacks with rock-free earth) will be spaced at every 25 to 100 feet along the alignment. The spacing of the trench plugs will be based on the slope of the terrain, sharp changes (greater than 5 degrees) along the trench line, and locations where backfill material may cause the trench to act as a drain.	Project Sponsor is responsible for contractor compliance.	During construction activities.	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.	Considered complete after pre-construction and construction activities have ended.
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Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
<i>Mitigation Measure M-HY-1b: HDD Fluid Release Contingency Plan</i> PG&E shall prepare and implement an HDD Fluid Release Contingency Plan. The plan shall include specific frac-out contingency measures, material required to contain a frac-out or fluid spill, and control measures to ensure that drilling mud is contained. PG&E shall submit the HDD Fluid Release Contingency Plan to the CDFW for review (if required by that agency) at least 30 days prior to the commencement of project activities. If an HDD Fluid Contingency Plan is not required by the CDFW, PG&E shall submit the plan to the ERO at least 30 days prior to commencement of project activities. HDD-related project activities may not start until PG&E has received written notification either from the CDFW that the HDD Fluid Release Contingency Plan has been accepted, or from the ERO. PG&E shall ensure that all material necessary to contain a frac-out or fluid spill shall be on site and immediately available prior to the commencement of HDD activities.	Project Sponsor is responsible for contractor compliance.	During construction activities.	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.	Considered complete after construction activities have ended.

HAZARDS AND HAZARDOUS MATERIALS

<i>Mitigation Measure M-HZ-2: Treatment of Unanticipated Hazardous Materials</i> If any stained or odiferous soils that may be considered hazardous materials are encountered during project-related excavation activities, PG&E shall immediately halt work and properly characterize the material, and shall take appropriate measures specific to the materials to protect human health and the environment. PG&E will comply with all existing federal and state hazardous materials regulations. If the results of soil testing indicate that the project spoils are hazardous, PG&E shall manage and dispose of the waste through a separately contracted vendor certified through the Contractors State Licensing Board for hazardous waste removal, and send the waste to an appropriate Class 1 disposal facility. Hazardous spoils awaiting disposal shall be appropriately labeled and shall be contained or stockpiled with	Project Sponsor is responsible for contractor compliance.	During construction activities.	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.	Considered complete after pre-construction and construction activities have ended.
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Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
plastic encapsulation to prevent sedimentation.				
Mitigation Measure M-HZ-3: Notify and Consult with Affected Schools PG&E shall provide written notification of the proposed project to schools located within 0.25 mile of the project site, including West Hillsborough Elementary School and Highlands Elementary School. PG&E also shall consult with appropriate school or district personnel about the types of construction activities that shall occur and the estimated timing of such activities, as well as provide examples of the types of hazardous materials that could be used during construction activities.	Project Sponsor	During pre-construction activities.	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.	Considered complete when schools are notified during pre-construction activities.
Mitigation Measure M-HZ-6: Fire Avoidance and Suppression PG&E shall clear trees and shrubs in accordance with utility corridor standards, which include no structures or trees within a 20-foot pipe zone (10 feet on each side of the pipeline). On-site chipping may be allowed, subject to approval by the landowner. If chipping is allowed, all debris less than 6 inches in diameter shall be chipped by the PG&E contractor if the site is within 100 feet of a service road. Chips shall be broadcast or hauled away. All wood from trimming and removals that is larger than 16 inches in diameter may be left on site in lengths of 8 feet or less. Tree debris less than 16 inches in diameter that is not chipped shall be hauled away. Project personnel shall be directed to drive on areas that have been cleared of vegetation; park away from dry vegetation; and carry water, shovels, and fire extinguishers in times of high fire hazard. PG&E shall also prohibit trash burning, and no smoking is permitted within SFPUC Watershed lands. Additionally, clearly marked fire-suppression materials and equipment shall be stored adjacent to all work areas and within staging areas. The project sponsor and/or its contractor shall contact the SFPUC Natural Resources and Lands Management Division (NRLMD) Watershed Forester 24 hours in advance of work to confirm that conditions are suitable for construction. In addition, the project sponsor and/or its	Project Sponsor is responsible for contractor compliance.	During construction activities.	Project Sponsor shall be responsible for periodic reporting to Planning Department regarding compliance; Planning Department responsible for monitoring Project Sponsor compliance.	Considered complete after pre-construction and construction activities have ended.

Adopted Mitigation Measures	Responsibility for Implementation	Mitigation Schedule	Monitoring/ Reporting Responsibility	Monitoring Schedule
contractor shall submit fire prevention measures, particularly for any hot work (e.g., welding), to the NRLMD Watershed Forester for review and approval. During construction, the project sponsor and/or its contractor shall contact the National Weather Service daily to confirm that local weather conditions are suitable for construction activity. The project sponsor and/or its contractor will cease all construction activities during red flag days (high fire hazard periods) or if directed to do so by the NRLMD Watershed Forester.				

FINAL
GAS TRANSMISSION PIPELINE 109 REPLACEMENT PROJECTS
VEGETATION RESTORATION PLAN, PART 2

PACIFIC GAS & ELECTRIC COMPANY

Prepared by



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MARCH 2018

REVISED FEBRUARY 7, 2019 (REVISION 8)

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Section 1. INTRODUCTION

This Line 109 Tree Replanting Plan (Part 2) has been prepared to satisfy the mitigation requirements under the San Francisco Planning Department's (SF Planning) Initial Study/Mitigated Negative Declaration (IS/MND; Sept 2016) and California Department of Fish and Wildlife's (CDFW) Final Lake or Streambed Alteration Agreement (LSAA) Notification No. 1600-2018-0029-R3 for the PG&E Gas Line 109 Replacement Project. The relevant conditions of these documents are referenced below:

CDFW

Tree mitigation is identified in Condition 3.3, Tree Planting, of the California Department of Fish and Wildlife's (CDFW) Final Lake or Streambed Alteration Agreement, Notification No. 1600-2018-0029-R3, for the PG&E Line L109 Cañada Road Pipeline Replacement Project. Per conditions of the SAA, a total of 38 trees are associated with 1602 jurisdiction (see Table 1). If these trees are not planted by January 15, 2019, the mitigation ratio for the 1602 portion of the revegetation will increase to 4.5:1 from the current 3:1 ratio. The mitigation ratio for native trees shall be 3:1 if the tree seeds (or seedlings if not on restricted lands) are planted no later than January 15, 2019.

SF Planning

Tree mitigation is identified in Mitigation Measure BI-1f: Habitat Protection Measures, and MM BI-5, Pre-construction Tree Surveys and Tree Removal, of the San Francisco Planning Department's PG&E Line 109 Replacement Project CEQA IS/MND. The IS/MND requires mitigation for oaks and other trees removed during construction of the L109 projects. This plan addresses the tree mitigation requirements for the Line 109 4A2 Bunker Hill, 4C Crystal Springs, and 4A1 Cañada Road Replacement Projects (collectively referred to as the L109 project).

In 2016, the IS/MND stated that:

- Tree replacement ratios shall be 3:1 for native oak trees;
- Each native tree that meets the definition of "Significant" tree or "Heritage" tree in the San Mateo County Significant Tree Ordinance shall be replaced at a 3:1 ratio; and
- Mitigation Measure-M-BI-5 states that any native tree removed (applies to non-significant and non-heritage trees) shall be replaced at a minimum mitigation ratio of 1:1
- Non-native trees, such as Monterey pine, Monterey cypress, and *Eucalyptus*, shall be replaced 1:1 with native tree species.

Tree Mitigation Requirements

Figures depicting the location of the Line 109 project are provided in Appendix A. The IS/MND specified replacement of trees would: (1) be planted on-site in the temporary construction easement on the SFPUC Peninsula Watershed, to the extent consistent with the SFPUC's Peninsula Watershed Management Plan, as determined by SFPUC's Natural Resources Land Management Division biologist; (2) any replacement trees that exceed the capacity of the Peninsula Watershed, as determined by SFPUC's Natural Resources Land Management Division biologist, shall be replanted off-site.

Brief details concerning implementation of on-site tree planting mitigation for tree removal during construction activities are contained in the Vegetation Restoration Plan (VRP) for the 4A2 Bunker Hill segment (Nomad 2016) and 4C Crystal Springs segment (Nomad 2017) which were reviewed and approved by San Francisco Public Utilities Commission (SFPUC) and California Department of Fish and Wildlife (CDFW) prior to implementation of each phase of the project. The Cañada Road segment VRP

(third revision) was submitted in April 2018 (CH2M and Nomad 2018); project construction for this segment began in May 2018. In response to new information and requirements from agencies concerning tree planting, PG&E intends the plans contained in this revision to supersede those documents.

After the initial preparation of the VRPs for the project, it was determined that a portion of the tree planting could no longer be conducted onsite and that some offsite revegetation locations would be needed to fully offset tree impacts. More detailed information on tree replanting has therefore been included in this separate revegetation plan (referred to as Part 2). The approved VRPs addressing grassland and scrub vegetation on the Bunker Hill, Cañada Road, and Crystal Springs project segments are collectively referred to as the Vegetation Restoration Plan(s) Part 1.

The following sections of this VRP Part 2 describe the proposed compensatory mitigation approach, implementation objectives for both on-site and off-site mitigation, non-native species removal, adaptive management strategies, and the maintenance activities, success criteria, monitoring, and reporting that will be necessary to successfully complete the restoration.

All aspects of this plan, including project implementation, agency coordination, biological monitoring, report preparation, adaptive management recommendations, field assignment of tasks, and compliance reporting to respective agencies will be overseen and managed by the PG&E Restoration Biologist as the project lead over the 7-year period of performance.

Section 2. MITIGATION APPROACH

This section describes the compensatory mitigation approach that will be implemented to mitigate impacts to trees from the project. Table 1 provides a summary of the trees removed from the three Line 109 segments by size class, and the number of trees to be planted to comply with MM BI-1f, MM BI-5, and the CDFW LSAA. Table 2 provides a summary of the compensation proposal.

2.1. NUMBER OF TREES REMOVED FROM THE L109 PROJECTS

A total of 833 trees were removed from Bunker Hill, Crystal Springs, and Cañada Road (Table 1). Of these, 485 trees are found within the Cañada Road Segment, of which 38 trees are within the CDFW's 1602 riparian jurisdiction (Table 1). Based on the mitigation ratios established in the CEQA document, 1,803 trees are required to mitigate for project tree impacts (See Table 1 for details on trees impacted by segment, by size class). Native trees are listed first in the table followed by non-native trees.

2.2. TREE MITIGATION APPROACH

The approach to meeting the tree mitigation objectives for the Line 109 Project consist of three components:

- (1) on-site enhancement and restoration within SFPUC-approved areas within the temporary construction easement.
- (2) off-site oak woodland restoration at Wunderlich County Park, and
- (3) one-time compensation to the Town of Hillsborough for tree planting.

The number of trees that will be mitigated through each of these approaches is listed in Table 2. Each component of the mitigation approach is discussed further below.

2.2.1 ON-SITE PLANTING WITHIN THE TEMPORARY CONSTRUCTION EASEMENT

For onsite planting, a safety review by the PG&E gasline safety team was performed, and in addition, the SFPUC verified that 124 trees can be planted in the temporary construction easement (which includes riparian areas within the Cañada Road segment) (Figures 4a-4f in Appendix A). The final planting locations and numbers were approved by the SFPUC on August 29th, 2018. Trees may only be seeded outside of restricted areas away from the pipeline centerline as required for pipeline safety (PG&E 2014)¹. The approximate location of potential tree planting areas in the temporary construction easement are shown on Figures 4a through 4f provided in Appendix A. Tree planting on-site will occur as specified in the previously submitted and approved Vegetation Restoration Plans for the Bunker Hill, Crystal Springs, and Cañada Road segments (CH2M and Nomad Ecology LLC. 2017; CH2M and Nomad Ecology LLC., 2018, and Nomad Ecology LLC., 2016).

Any trees planted on-site will be counted towards meeting a portion of the mitigation requirement.

⁴ For example, trees, woody shrubs, or woody vegetation that may exceed 8 inches diameter at breast height at maturity cannot be planted within 10 feet of the pipeline centerline. Trees expected to grow to or exceed 36 inches diameter at breast height cannot be planted within 14 feet of the pipeline centerline.

Table 1. Tree Impacts at Bunker Hill, Cañada Road, and Crystal Springs Projects and Corresponding Mitigation Ratio

TREES	R-185 BUNKER HILL	R-046 CAÑADA ROAD (INCLUDES TREES LOCATED IN CDFW 1602 SAA PERMIT AREA*)	R-048 CRYSTAL SPRINGS	ALL THREE PROJECTS	MITIGATION RATIO	TOTAL COMPENSATION REQUIREMENT PER CEQA MEASURE
CRITERIA	COUNT	COUNT	COUNT	TOTALS		
<5" DBH Oak	3	33 (0)	2	38	0	0
Non-Significant Oak (>=5" & <12" DBH)	3	158 (4)	24	185	3:1	555
Significant Oak (>=12" & <=48" DBH)	15	225 (17)	44	284	3:1	852
Heritage Oak (>48" DBH)	1	10 (0)	4	15	3:1	45
<5" DBH Non-Significant Native*(Non-Oak) Tree	0	1 (1)	0	1	0	0
Non-Significant Native (Non-Oak) Tree (>=5" & <12" DBH)	0	20 (12)	7	27	1:1	27
Significant Native (Non-Oak) Tree (>=12" & <=48" DBH)	0	12 (3)	11	23	3:1	69
Heritage Native (Non-Oak) (>48" DBH)	0	2 (0)	0	2	3:1	6
Subtotal Native Trees	22	461 (37)	92	575		1,554
<5" DBH Non-Significant Non-native Tree	3	5 (0)	1	9	0	0
Non-Significant Non Native Tree (>=5" & <12" DBH)	4	4 (0)	47	55	1:1	55
Significant Exotic Tree (>=12" DBH)	19	15 (1)	160	194	1:1	194
Subtotal – Non-native Trees	26	24 (1)	208	258		249
Total All Trees (Native and Non-Native)	48	485	300	833		1,803
Note: Tree impact numbers verified using arborist data layers in June 2018 and again in September 2018. One minor revision was made to this tree summary table from the draft. The previously reported count for Non-Significant Native (Non-oak) trees erroneously included both those that did and did not meet the definition of “trees” under CA Public Resources Code 21083.4 (which is greater or equal to 5 inches in DBH). Two categories were subsequently created 1) Non-Significant Native (Non-Oak) trees less than 5 inches DBH and 2) Non-Significant non-native trees less than 5 inches DBH. Trees that meet these definitions were removed from the other categories and removed from the total commitment. In addition, size ranges for all categories of trees were added into Table 1 for clarification.						

TREES	R-185 BUNKER HILL	R-046 CAÑADA ROAD (INCLUDES TREES LOCATED IN CDFW 1602 SAA PERMIT AREA*)	R-048 CRYSTAL SPRINGS	ALL THREE PROJECTS	MITIGATION RATIO	TOTAL COMPENSATION REQUIREMENT PER CEQA MEASURE
The proposed revision to the Mitigation Measure MMBI-1f states that: “Each native tree that meets the definition of “Significant” tree or “Heritage” tree in the San Mateo County Significant Tree Ordinance shall be replaced at a 3:1 ratio; and Non-native trees, such as Monterey pine, Monterey cypress, and <i>Eucalyptus</i>, shall be replaced with 1:1 with native tree species”. No mitigation is assumed for those oaks less than 5 inches DBH because these are not considered to be trees per the San Mateo County tree ordinance. Native trees include California buckeye, California bay, madrone, maple, toyon (that meet the size definition) and willow. * The number of trees included in the total tree count that are within the CDFW 1602 jurisdiction and covered by the Streambed Alteration Agreement (SAA) for the project are shown in parenthesis. The SAA only covers the Cañada Road segment of the L109 projects. References: http://sfmea.sfplanning.org/2013.1761E_Final%20MND%20PGE%20Line%20109.pdf http://sfmea.sfplanning.org/2013.1761E_Final%20MND%20PGE%20Line%20109.pdf Bunker Hill Restoration As-Built Report prepared March 14, 2017; Crystal Springs Restoration As-Built Report prepared March 14, 2018; Cañada Road VRP (Nomad and CH2M 2018).						

¹The tree removal numbers may change slightly as construction at Cañada Road takes place in 2018. Updated tree removal numbers and replacement totals will be reported in the Cañada Road restoration as-built implementation memo. Final tree removal numbers for the Cañada Road segment will be provided to SF Planning and CDFW under separate cover once construction is complete.

Table 2. Tree Compensation Breakdown

MITIGATION APPROACH COMPONENT	PLANTING LOCATION	TREE COMPENSATION
On-site restoration within SFPUC-approved areas	Temporary Construction Easement and Drainages (Cañada Road and Bunker Hill Segments)	124
Off-site oak woodland restoration at Wunderlich County Park	16 Acres at Wunderlich County Park (maintaining an average stocking rate of 100 native trees per acre)	1,600
<i>Eucalyptus</i> and <i>Acacia</i> removal and weed suppression over the period of performance [†]	16 Acres at Wunderlich County Park	Temporal loss
One-time compensation to the Town of Hillsborough (funding sufficient to replant and maintain 202 mature trees) [†]	Town of Hillsborough to direct replanting	202
Total Number of Trees to be Compensated or Restored		1,926
Total Number of Trees Required (see Table 1)		1,803
Tree Compensation in Excess of the 1,803 Stems Required		123

[†]These components of the mitigation proposal are intended as compensation for temporal loss.

2.2.2 OFF-SITE PLANTING AT WUNDERLICH COUNTY PARK

PG&E has identified a partnering opportunity with San Mateo County Parks (SMCP) to complete a proposed oak woodland mitigation project in Wunderlich County Park, near the City of Woodside, to meet a large portion of the cumulative tree mitigation requirements of all three L109 projects. Efforts were made to locate a suitable restoration site that was as close to the project as possible but could also support a sufficient restoration effort to meet the mitigation requirement. The site was chosen by San Mateo County Parks because it previously supported woodland habitat, is as close to the project site as possible, is adjacent to high-quality native woodland habitat, and currently has a scattered understory of native shrub species which is expected to facilitate establishment of the existing native trees and native understory after the non-native tree canopy is removed.

Wunderlich County Park is located approximately 4 miles from the nearest L109 project segment – 4A1 Cañada Road. The location of Wunderlich County Park is shown on Figures provided in Appendix A. Two mitigation sites totaling 16 acres are shown on these figures: a 6-acre site and a 10-acre site. *Eucalyptus* trees will be removed over the entire 16 acres and weeds and *Eucalyptus* resprouts controlled for the duration of the 7-year monitoring period. Consistent with California Department of Forestry and Fire Protection Forest Practice Rules, and in the interest of restoring a diverse oak woodland, the restoration will include replanting and/or fostering of both oaks and other native oak woodland hardwood trees native to Wunderlich (such as buckeye) throughout the 16 acre restoration site. Appendix B provides background information on Wunderlich County Park, including a list of invasive weed species observed in the restoration site. The general restoration approach will be to remove *Eucalyptus* trees, and to the extent necessary to facilitate growth of native trees, plant acorns and buckeyes, install plant protection, control non-native species, allow time for the natural succession of native trees and understory plants, monitor site progress to determine if additional on-site planting is necessary to meet restoration goals, and use adaptive management to ensure that the stocking rate is met. The goals and strategy for off-site restoration at Wunderlich are discussed in detail in Section 2.3.

2.2.3 COMPENSATION FUNDING FOR TOWN OF HILLSBOROUGH

PG&E has met with the Town of Hillsborough on several dates in 2016 and 2017 to discuss the tree mitigation objectives of the project. PG&E and the Town of Hillsborough agreed on January 14, 2019 for PG&E to provide one-time compensation in the amount of \$263,622 to the Town of Hillsborough to offset the impacts of tree removal. PG&E will provide compensation equal to the current market rate for the purchase, installation, irrigation, and maintenance for 202 mature trees. The estimate was formulated based on the following (Davey Resources Group, 2018):

- Purchase and installation of 202 mature trees, 24 inch box and 15 gallon sizing.
- The trees will be a mixture of native California Live Oak, Blue Oak and California Buckeye.
- Irrigation and other materials needed for plant installation

2.3. OFF-SITE MITIGATION AT WUNDERLICH COUNTY PARK

The location of Wunderlich County Park is shown on Figures provided in Appendix A. A total of 16 acres will be restored (a 10-acre and a second 6-acre site). These restoration sites are in the eastern portion of the park (Figure 2, Appendix A). The location of the restoration sites is also shown on the Woodside 7.5-minute USGS Topographic Quadrangle (Figure 3, Appendix A).

2.3.1 GOALS OF THE MITIGATION AT WUNDERLICH COUNTY PARK

The pre-existing native woodland at the restoration site in Wunderlich County Park was destroyed when the area was logged and a *Eucalyptus* plantation was installed in its place in the early 1900s. Woodland restoration is proposed at Wunderlich County Park by implementing a combination of restoration techniques. Intensive, large-scale removal of mature *Eucalyptus* trees will be performed over a total of 16 acres (a 10-acre and a second 6-acre site). A total of 14 acres will be stocked with oak woodland species at 100 trees per acre (TPA). Consistent with California Department of Forestry and Fire Protection Forest Practice Rules, and in the interest of restoring a diverse oak woodland, the restoration will include replanting and/or fostering of both oaks and other native oak woodland hardwood trees native to Wunderlich (such as buckeye) throughout the 16 acre restoration site. Large-scale eucalyptus tree harvesting and ongoing suppression is expected to remove competitive pressure exerted on the native trees and allow for restocking via natural recruitment.

The primary goals of the project will be restoration of an average of 100 trees per acre of oak woodland trees. This would be accomplished by removing exotic tree species, eradicating and suppressing weed growth, maintaining live stock of oak woodland species, allowing the native tree and shrub understory to naturally regenerate, and planting tree seeds as needed to achieve the target coverage. Any tree planting is preferred from seeds, as directed by SMCP to minimize the risk of spreading weeds and soil-borne pathogens. Acorns have been collected between September and November 2018 and will be planted at Wunderlich County Park prior to January 15, 2019. In the event that acorn plantings do not begin according to this schedule, PG&E will report to the agencies by January 15, 2019, and further adjustments for temporal loss of ecosystem function will be added to this proposal before this Plan can continue to remain in effect. Planting locations will be marked using flags or other low-profile marking for avoidance where possible. Acorns and buckeye seeds planted will also be GPSed. In general, the acorns and buckeye seeds will be protected by an 8-inch layer of mulch and buried under the soil. No tracked equipment is planned to be used to minimize soil disturbance in the planting area. As acorns and buckeyes germinate and grow, and recruits are identified during monitoring, they will be protected from browsing with tree shelters, tubes, or cages. Monitoring and intensive weed control will be performed as described in Section 3. If results of monitoring show that additional planting is needed to maintain the average stocking rate (1,600 trees over the 16 acres) then PG&E will implement adaptive management measures including

selective planting or seeding native trees on-site to maintain the stocking rate. Adaptive management actions are described in Section 3.

2.3.2 EUCALYPTUS TREE REMOVAL AND RESTORATION ON OTHER PROJECTS

PG&E and Consultants have reviewed multiple *Eucalyptus* removal projects that have been occurring throughout the Bay Area that include both active planting (planting trees and shrubs following *Eucalyptus* removal) and natural regrowth (allowing natural recruitment to occur over a timeframe after *Eucalyptus* removal with no immediate planting). The goal of this review was to identify the best possible approach for a successful project at Wunderlich Park.

The East Bay Regional Park District has thinned and removed acres of *Eucalyptus* in their parks. They rely on recruitment of native vegetation into the areas where non-native trees have been removed from the overstory canopy (USFWS 2013). One site in Tilden Park had mature *Eucalyptus* trees removed in 2007 and 2012 and no planting occurred (Michele Hammond, pers. comm. July 2018). By 2018 the site was dominated by a canopy of coast live oak and bay trees and a diverse understory of native shrubs (Erin McDermott, pers. observation. 2018). Similarly, restoration projects on steep slopes in Big Sur focused on *Eucalyptus* removal and follow up weed control, with no planting, and the site colonized with a native plant palette a few years later (Sarah Godfrey, pers. comm. Feb. 2018).

Restoration projects on Golden Gate National Recreation Area lands have included *Eucalyptus* removal in coastal scrub and a combination of planting of container stock including oak trees, buckeye trees, and shrubs into *Eucalyptus* mulch (Maria Alvarez, pers. comm. Feb. 2018) as well as natural succession areas where no container plants were planted (Christina Crooker, pers. comm. July 2018). They found that natural succession was not successful at these sites as weeds invaded and ultimately container planting was necessary (Christina Crooker, pers. comm. July 2018). Similarly, at *Eucalyptus* removal and restoration projects in San Diego County, recruitment was low and container planting was required (Stacy McCline, pers. comm. Feb. and July 2018). Wunderlich Park has the benefit of a robust native understory that could be expected to thrive once released from *Eucalyptus* suppression. The response to competition release from *Eucalyptus* removal and natural recruitment appears to be site dependent and best monitored over time through an adaptive management process. As such, the adaptive management process will be employed to deliver a successful oak woodland restoration project at this unique site.

2.3.3 TARGET TREE DENSITY

PG&E will maintain an average stocking rate of 1,600 native trees restoration site. This corresponds to a density of approximately 100 trees per acre (or approximately 20-foot on center triangular spacing). Trees that are planted will not be planted in rows but will be planted in natural appearing groupings. Trees may do slightly better or slightly poorer on some portions of the restoration area depending on site specific variables (e.g., slope, aspect, soils).

Site visits to investigate tree density of woodlands in San Mateo County parks were conducted by Nomad Ecology at reference sites at Wunderlich County Park, Edgewood Park, and Huddart Park in coast live oak woodland and mixed evergreen vegetation. Trees were defined as trees having DBH greater than 5 inches, similar to the SM County tree ordinance threshold. Tree density at the oak woodland reference sites ranged from 102-206 trees per acre and averaged 169 trees per acre overall (Nomad Ecology 2018).

Success criteria in meeting SMCP's approved stocking rate are described in Section 3. Success criteria will be established to monitor the performance of the restoration site over time. Success criteria will provide triggers for adaptive management techniques that would be prescribed based on the expertise of the qualified forester and restoration ecologist and in consultation with SMCP NRM staff if criteria are not being met.

After the 7-year monitoring performance period is complete and success criteria have been met, SMCP may elect for PG&E to conduct one time vegetation thinning (e.g., remove those trees in poor health or those that may be crowding other desirable natives) to achieve a park-directed desired aesthetic or for other ecological reasons, contingent on maintaining the 100 TPA stocking rate and complying with forest practice rules. Any thinning actions must maintain the requirements set forth by this plan. San Mateo County Parks will retain authority over management of the project site after the period of performance concludes.

2.3.4 OAK WOODLAND RESTORATION APPROACH

The oak woodland restoration will begin with oak acorn and buckeye seed collection and baseline weed mapping in Fall 2018. Acorns and buckeye seeds will be installed prior to January 15, 2019. Native species will be flagged for avoidance, to the extent feasible, and *Eucalyptus* trees and invasive weeds will be removed, and non-native species will be controlled throughout the monitoring period. Natural succession of native trees will be tracked, site progress will be monitored, and adaptive management will be used to determine if additional on-site planting is necessary to meet restoration goals. If planted native oak woodland trees die, they will be replaced on an annual basis with newly planted seeds to meet the maintenance stocking rate of 100 TPA. Since planting is planned to be clustered in a more natural growth pattern rather than in rigid rows, and regeneration of trees and natural recruitment would also vary by area, some acres will have more trees than others but will average out to 100 TPA over the planting sites.

Clear cutting of the entirety of *Eucalyptus* stands at one time may be required, since trees left standing on a perimeter may become hazardous for park users. Adaptive management components include an initial monitoring phase and selective trials for management components such as weeding, irrigation, or other site maintenance activities. PG&E will be responsible for the costs of all irrigation. Removal of the *Eucalyptus* canopy is expected to provide conditions in which the native understory is released from competition and naturally regrows. The phased sequence of proposed restoration actions is described below.

- Year 0-1:
 - Baseline surveys will be performed to document native and exotic cover prior to *Eucalyptus* removal. Depending on the exotic species found during the baseline surveys and mapping, pre-treatment or removal of species such as scotch broom prior to tree removal may be performed. PG&E will record this information in the quarterly reports.
 - Removal of invasive non-native vegetation such as blue gum *Eucalyptus* (estimated to be 1,200-2,700 trees per/acre), French broom, and other species that would interfere with the attainment of increased native cover.
 - Following tree removal, tree material, including large and small branches and leaves, will be removed and disposed of offsite. A thin layer of mulch will be spread throughout the site to inhibit weed growth.
 - Select natives will be preserved to the extent feasible, based on the evaluation of a certified arborist (i.e. established oaks, madrones, buckeyes, etc.). These trees will be flagged in the field and be avoided by clearing activities.
 - Initial herbicide treatment of invasive non-native species (consistent with the SMCP existing approach and SMC IPM policy to treating invasive vegetation in the park) will be performed.
 - Coast live oak (*Quercus agrifolia*), black oak (*Quercus kelloggii*), and valley oak (*Quercus lobata*) acorns and buckeye seeds (*Aesculus californicus*) will be collected from

the park and the PG&E ROW between September and November 2018. The SMCP will be consulted regarding acorn collection on the park property to obtain permission and guidance on collection.

- Stocking the site with acorns and buckeye seeds will occur prior to January 15, 2019.
- Years 2-7
 - Monitoring will be performed over the 7-year monitoring period to collect data needed to track trends and assess the number and condition of oaks and other native trees that have been established.
 - Invasive weed species removal, including *Eucalyptus* treatment and removal, will be performed throughout the monitoring period.
 - As determined necessary to meet restoration goals, adaptive management actions will be performed to enhance the restoration site as determined by the PG&E Biologist and qualified forester/restoration ecologist and in consultation with SMCP NRM staff approval. These potential actions are listed in Section 3.
 - Annual reports documenting results of monitoring will be provided to SMCP, SF Planning, and CDFW.

2.3.5 RESTORATION BIOLOGIST

The PG&E restoration biologist, with support of internal and external staff, will lead the oversight, monitoring, and implementation of this plan. The overseeing biologist will have a Biology or Restoration Ecology degree and minimum of 5-years of experience with native habitat restoration projects. The PG&E restoration biologist will be responsible for overseeing and directing all mitigation activities including supervising tree removal, mulching, weed control, monitoring, maintenance, and reporting.

2.3.6 EUCALYPTUS TREE REMOVAL

The exact methodology for tree removal at Wunderlich County Park will be determined by the PG&E Restoration Biologist in coordination with SMCP, PG&E, CalFire, and the tree removal contractor, in compliance with Forest Practice Rules. It is expected that trees will be removed using chainsaws, masticators and/or other heavy equipment using typical forestry methods. Trees will be cut as close to the ground as feasible, and stumps will remain on site and not be ground. Native trees within the clearing area will be flagged by the monitoring biologist for avoidance where feasible.

To suppress potential blue gum *Eucalyptus* (and any other invasive tree species) re-sprouts, all cut stump cambium would be chemically treated with Garlon 4 Ultra (triclopyr). Practitioners have also reported success using a mix of Garlon 4 Ultra and Rodeo (glyphosate) (DiTomaso, J.M., G.B. Kyser et al. 2013). As detailed above, for best control of blue gum *Eucalyptus* and to reduce resprouting and the level of effort for follow up control, herbicide application needs to occur within one minute of tree or final stump removal. However, in projects such as this where hundreds of trees need to be logged and removed, treating single trunks within one minute may not be feasible or safe. Acceptable results have been reported by cutting stumps again and applying the herbicide within 2 weeks of the second cut (DiTomaso, J.M., G.B. Kyser et al. 2013).

During large scale tree removal, herbicide applicator personnel are subject to a safety hazard during tree cutting if they are present close enough to the tree being removed to treat the stumps within 1 minute of cutting. For the safety of the herbicide applicators during tree removal, a phased approach can be used in coordination with the tree removal contractor.

Due to safety concerns, herbicide will be applied using a combination of the following methods:

1. Immediate application: treating the cut face immediately (within 1 minute) after initial tree removal with stumps cut at or around ground level
2. Secondary cut application: leaving 2-4 feet of stump during large-scale operations, returning within 2 weeks to re-cut stump by hand to around ground level and perform immediate application per the first method on the newly cut ground-level stump.

In the case of the secondary cut application method, during initial tree removal, trees are cut and removed from the site leaving stumps that are 2 to 4 feet tall. Then, up to two weeks later, the stumps are re-cut by a chainsaw operator close to ground level and treated with herbicide within one minute of the second cut. Debris from the second cut will be removed off-site.

During tree removal, the larger trees will likely be stripped of their limbs, skidded, and removed by truck. Additional slash will be mulched into trucks. A thin layer of mulch will remain on-site to help prevent weeds from germinating and provide benefits of mulch and the excess debris will be removed off-site.

The monitoring biologist will ensure that the vegetation removal contractor leaves a thin layer of mulch (a total 8 inches maximum of cover over bare mineral soil, where exposed) where required to provide the well-documented benefits of mulch (weed suppression, improved water relation, etc.). The mulch will help stabilize the soil following tree removal and minimize erosion and weed growth. The mulch will be comprised of *Eucalyptus* duff and chipped *Eucalyptus* wood. Care will be taken to ensure mulch is not spread at depths thicker than 6-8 inches so as to not prevent recruitment. Mulch in excess of an 8-inch layer will be removed from the site. Mulch will be placed away from tree trunks and will not extend off the 16-acre restoration site. Retaining *Eucalyptus* mulch on site has been identified as a crucial component in several successful restoration projects on Golden Gate National Recreation Area land, San Bruno Mountain, and County lands in San Diego, among others.

Desirable understory native vegetation in the restoration area will be protected and avoided during tree removal as feasible. Care will be taken to protect understory native vegetation in park areas bordering the restoration site.

2.3.7 WEED CONTROL PRIOR AND IMMEDIATELY FOLLOWING TO TREE REMOVAL

Several invasive weed species, including silver wattle, Italian thistle (*Carduus pycnocephalus* subsp. *pycnocephalus*), bull thistle (*Cirsium vulgare*), Scotch broom (*Cytisus scoparius*), Bermuda buttercup (*Oxalis pes-caprae*), French broom (*Genista monspessulana*), and periwinkle (*Vinca major*), were observed in the 16-acre restoration site at Wunderlich County Park during site visits on January 11, February 14, and August 30, 2018 (see species list in Appendix B). Additional invasive weeds may also be present. These may or may not require control, depending on their location, abundance, and Cal-IPC and CDFA ranks and their potential to interfere with successful restoration.

The Invasive Weed Best Management Practices in Appendix C will be implemented to reduce the likelihood that invasive weeds that are present at the site prior to tree removal are spread, or new non-native invasive species are introduced. Site preparation to control existing invasive weeds ahead of the *Eucalyptus* removal will occur. Mulch application as described in Section 3 will help to minimize any new infestations of weeds on-site. Any disturbed bare ground areas that are not mulched will be seeded as described under Adaptive Management or with another seed mix that has been approved by the SMCP. Adaptive management including weed control activities during the monitoring period are discussed in Section 3. Although comprehensive weed control will be performed onsite during the period of performance, it is not expected that this project will eradicate invasive weeds onsite, particularly those with a relatively long-lasting (e.g., 50+ year) seed bank.

2.4. TEMPORAL LOSS MITIGATION

To address the temporal basis of loss of oak woodland habitat that started in 2016, PG&E will expand the Plan design as follows actions:

(1) PG&E will provide compensation for 202 trees in excess of the 1,803 required by the CEQA document through one-time funding to the Town of Hillsborough (Table 2).

(2) The dense monoculture of *Eucalyptus* at Wunderlich County Park crowds out native tree, shrub, and herbaceous species, resulting in low plant diversity and diminished wildlife habitat values. PG&E will remove *Eucalyptus* on a total of 16 acres at Wunderlich County Park and facilitate natural recovery of native vegetation through targeted weed management and replanting as needed, during a 7-year monitoring period. *Eucalyptus* removal and intensive weed management actions performed at the Wunderlich parcel are not required by the CEQA measures but greatly increase the value and likelihood of success of the restoration project. This will in turn benefit local wildlife including nesting birds and bats.

The actions outlined in Table 2, meet PG&E's mitigation requirement under CEQA Mitigation Measure MI-B1f, Mitigation Measure M-BI-5, and the Line 109 CDFW 1602 LSAA, provided that actions begin on the schedule described in this version of the Plan. Delay for acorn planting beyond January 15, 2019 will result in the need for PG&E to notify the agencies and amend the restoration obligation in order to keep the Plan approval in effect. They also provide the additional benefits described above, which offset the temporal effects to oak woodland habitat of delays in replanting to date.

2.5. TREE PLANTING

Tree planting will consist of native tree container stock or direct seeding as described below in Table 3.

2.5.1 PLANTING PALETTE

The planting palette is based on surveys of adjacent woodlands at Wunderlich Park and input from San Mateo County. California bay (*Umbellularia californica*) and tanoak (*Notholithocarpus densiflorus*) were not included in the planting palette due to *Phytophthora* concerns as these species are a major source of inoculum for the pathogen and appear to play an important role in spreading Sudden Oak Death (Alexander & Swain 2010). California bay and tanoak are current constituents of the understory and are anticipated to naturally colonize the Wunderlich County Park restoration site. All restoration activities will follow the *Guidelines to Minimize Phytophthora Contamination in Restoration Projects* as specified by the Working Group for *Phytophthora* in Native Habitats (2016)

Table 3. Planting Palette

COMMON NAME (SCIENTIFIC NAME)	DIRECT SEEDING	CONTAINER SIZE
coast live oak (<i>Quercus agrifolia</i> var. <i>agrifolia</i>)	Acorn	deepot, treepot, or treeband
black oak (<i>Quercus kelloggii</i>)	Acorn	deepot, treepot, or treeband
valley oak (<i>Quercus lobata</i>)	Acorn	deepot, treepot, or treeband
California buckeye (<i>Aesculus californicus</i>)	Seed	deepot, treepot, or treeband

Per SMCP requirements, *Phytophthora* control and testing will be implemented if any container stock are used. All containerized stock will have a clean bench leachate pear baiting test conducted ahead of outplanting. Any container stock that fails the bench leachate methodology will not be planted. Pear baiting techniques are described in: *Testing Procedures for BMPs for Producing Clean Nursery Stock* (Bernhardt and Swiecki, 2017).

As directed by SMCP, oaks will be direct seeded to the extent feasible. If an insufficient number of acorns are available to complete the installation, oaks may also be planted from *Phytophthora*-free container stock depending on acorn production and container stock availability. Buckeyes will be direct seeded. All other tree species will be planted from container stock that has been verified to be free of *Phytophthora*. Proposed planting numbers and ratios are subject to change based on recommendations by the PG&E biologist and availability of acorns or container stock. Any changes to the planting palette would be approved by SMCP.

Source of Propagules

Seed Collection

Seeds will be collected from different trees within Wunderlich Park to ensure diversity. Seeds will be collected from healthy, vigorous, well formed, mature trees (NRCS 2009). Seed collection will be well documented, clearly indicating the following information: collectors' names, species, date and location of collection, and the date storage began and ended. If sufficient acorns and seeds are not available in Wunderlich Park, seed may be collected in nearby open space with approval by SMCP and adjacent land owners.

Acorns

Acorns of coast live oak and black oak (*Quercus kelloggii*) will be collected in in early fall, several weeks after the first acorns have started to drop, and after the acorns on the tree can be dislodged easily from the acorn cap by gentle twisting (McCreary 2009). Immature acorns cannot be ripened artificially after removal from the tree; therefore, acorns will not be collected until they are ripe. Collecting acorns from the ground will be avoided. All acorns will be soaked in a 5% bleach solution for 1 minute. Acorns will be subjected to a float test (McCreary 2009) and failed acorns discarded.

Acorn caps will be removed before storage. Following collection, acorns and buckeye seeds will be stored in a refrigerator in open bags with perlite until ready for planting. The acorns will be checked regularly to make sure they are not drying out. If acorns start to germinate during storage, they will be removed and planted as soon as possible. If mold develops during storage and the acorns are discolored or slimy, the acorns will be discarded (McCreary 2009).

Buckeye Seeds

Buckeye seeds can be collected from trees in early fall after the fruits have turned yellow or picked off the ground after dropping from the parent tree (Rudolf 1974). Following collection, buckeye seeds will be stored in a refrigerator in open bags with perlite until ready for planting.

Nursery Stock

Container plants will only be used at Wunderlich County Park and will not be used as propagules for the onsite tree planting in the on-site L 109 temporary construction easement (TCE) as required by San Francisco Public Utilities Commission Natural Resources Land Management Division (SFPUC NRMLD). At Wunderlich Park, container stock would be purchased from a nursery. Container stock will only be purchased from nurseries that implement the *Guidelines to Minimize Phytophthora Pathogens in Restoration Nurseries* as specified by the Working Group for *Phytophthora* in Native Habitats (2016). All

container stock will be tested for *Phytophthora* using pear baiting (Bernhardt and Swiecki 2017) or other reliable testing methods and only plants verified free of *Phytophthora* will be used.

Container plants should be grown from seed collected as near the project site as possible. Container-grown plants in tree tubes are generally preferable given a higher probability of survivorship compared to planting more mature container trees. The Watershed Nursery in Richmond, Central Coast Wilds (associated with Ecological Concerns Inc.) in Santa Cruz, and Grassroots Ecology (formerly Acterra Nursery) in Palo Alto, grow plants local to the Peninsula and follow specified management measures to minimize *Phytophthora*. Other nurseries may also be suitable. Coordination with the nurseries will ensure that sufficient seed is collected during the appropriate seed collection window to provide sufficient material and that they stock sufficient container stock. Container plants obtained from the nurseries will have sufficient root structure and size to survive installation. The PG&E biologist will conduct a nursery inspection to confirm that contract-grown plants are following required *Phytophthora* pathogen control measures and are suitable for planting. The inspection results will be included in reports to SMCP.

Plant Installation Methodology

Locations of plantings will be identified by PG&E's restoration biologist with colored flags corresponding to plant species or labeled with plant species names. After placement of location flagging, but before installation, the restoration site shall be inspected and confirmed by SMCP NRM staff. To obtain the target stocking rate of 100 TPA at the end of the monitoring period, overplanting may be performed to account for some expected amount of mortality. Trees will be planted in natural appearing groupings (not planted in rows) but will be present across the restoration site (that is, not grouped into one small part of the restoration site). At the end of the monitoring period, any trees in poor health or otherwise undesirable may be selectively removed while maintaining the 100 TPA stocking rate as required by SMCP, in compliance with forest practice rules. Any thinning activity that is conducted must maintain the requirements and success metrics set forth by this plan.

Prior to planting trees, any vegetation present will be scraped in an approximately 3 foot-diameter area. *Eucalyptus* mulch at will be pulled back to ensure plantings occur in soil. Container planting methodology will follow methods described in ANSI A300, Part 6, Tree Planting (International Society of Arboriculture, 2012). Disturbance will be minimized to the minimum necessary to achieve successful planting and irrigation basin formation. Container plants will be inspected prior to planting to verify healthy root development.

Up to three acorns will be installed in each planting hole at a depth of 1.5 inches and parallel to the soil surface when they are ungerminated. Germinated acorns will be planted with radicle pointed down. Up to two buckeye seeds will be installed per planting hole at 1 inch below the soil surface with the scar pointing down. Acorns and buckeye seeds will be spaced 2-6 inches apart.

A 3-foot diameter irrigation basin will be constructed around each planting location and irrigation basins will be surrounded by 4-inch high, 4-inch wide berms. A 2 to 4-inch thick layer of *Eucalyptus* mulch or other material such as straw mulch will be spread within the bottom of each irrigation basin to reduce weed competition and conserve moisture, taking care to ensure no mulch is touching the stem or crown of the plant.

All planted trees will be protected from herbivory using a double cage, tree tube, or other protective system. If a double-cage system is installed, an 8-inch-diameter tube constructed of half-inch wire mesh will be sunk 6 inches into the ground around the seeds or container planting and will extend above the ground at least 12 inches. Each tree will then have a larger wire cage installed around it, either at the time of planting or within 1 year. Two wooden posts or T-posts will be wired to the cage for stabilization. The purpose of these large outer cages is protection from deer as the tree grows. Other herbivory protection methods may be used as recommended by the restoration biologist. Each planting location will be tagged

with a metal tag with a unique number to use for mapping each planting location and tracking the success of plantings.

After the plants and protective hardware are installed, water will be applied slowly to the seeding site, so that all water percolates and no runoff occurs. Additional watering may be needed if rainfall is lower than average or seeding is performed outside the rainy season. The need for supplemental watering will be determined by the PG&E biologist.

2.5.2 IRRIGATION

Planted trees may be irrigated only if deemed necessary through the adaptive management process and may be irrigated up to three years. Irrigation methods may vary (hand watering, bladders, drip) and will be determined by a certified arborist after considering site constraints and species. Watering will be labor intensive and the need for watering will be determined by the PG&E biologist to achieve restoration goals. The timing and frequency of irrigation will be adjusted based on the amount of rainfall received during the growing season and the temperatures received. It is estimated that each tree may require 2-3 gallons every 6 weeks during the dry season (May through October) in the first year of monitoring, and irrigation will be performed less frequently in subsequent years as trees become established. The feasibility of a temporary irrigation system will depend on water availability and may require installation and resupply of a water tank. PG&E will bear all irrigation costs necessary to facilitate regrowth of the required trees, including water supply, costs of irrigation installation, maintenance, removal, and damages caused by water. The planting locations will be watered thoroughly when trees are installed. As outlined in Appendix D, measures will be implemented to supply and maintain clean irrigation components and minimize the risk of introducing *Phytophthora* in the irrigation water.

2.5.3 TREE REPLACEMENT

Dead trees or non-germinating acorns or direct seeding will be replaced as necessary. On an annual basis, PG&E will replace dead trees and maintain stocking rate of 100 trees per acre on average, as needed, throughout the site. If certain species are determined not to be successful they may be replaced with another native tree species included in the planting list or other species with approval by SMCP. The reasons for lack of success will be addressed and remedial measures implemented that may include increased watering, weeding, or additional protective shelters, wire cages, among others.

2.5.4 INVASIVE SPECIES CONTROL

Invasive weed species will be removed and controlled in the restoration site during the monitoring period as necessary to meet success criteria and keep the project on track to meet success criteria in the future. Invasive weeds present in the restoration site will be treated during an initial weed control effort and then twice annually during the duration of the monitoring period. Any infestations of invasive weeds that were observed in the Wunderlich restoration site (Appendix B) that occur outside of previously mapped areas or in greater abundance than noted in baseline surveys will be controlled. Any new invasive weed species not present prior to *Eucalyptus* removal will also be controlled. Invasive weed control may include mechanical methods including machete, hand pulling, mowing, grubbing, etc. If propagules are present, plants will be bagged and removed from the site, if feasible. All herbicide use will comply with applicable San Mateo County IPM policy. All herbicide use should occur in consultation with a licensed Pest Control Advisor and should follow all herbicide labels.

2.5.5 EUCALYPTUS SPROUT FOLLOW UP TREATMENT

Following the initial *Eucalyptus* removal at the Wunderlich County Park restoration site, all cut re-sprouts and new seedlings would receive semiannual follow-up treatment of herbicides (Garlon 4 Ultra or a mixture of Garlon 4 Ultra and RoundUp) to ensure the permanent elimination from the project area. All

herbicide use will comply with applicable San Mateo County IPM policy. All herbicide use should occur in consultation with a licensed Pest Control Advisor and should follow all herbicide labels. All *Eucalyptus* re-sprouts in the Wunderlich County Park restoration site will be treated.

2.5.6 SEEDING WITH A NATIVE SEED MIX

Broadcast seeding and hydroseeding for herbaceous species is not proposed because a layer of mulch will be spread on site and is expected to provide erosion control and inhibit the germination of non-native herbaceous annuals. However, broadcast seeding and hydroseeding with native herbaceous seed mix may be performed if small areas of bare ground are present or if it determined to be desirable by the PG&E biologist to increase native cover or out-compete invasive weeds.

Timing

If seeding is necessary to control erosion, seeding would occur in fall and early winter, before the onset of or during the rainy season, to increase the likelihood for sufficient rainfall and appropriate temperatures to trigger germination and support growth.

Seed Mix

Seed will be purchased commercially (from sources such as Pacific Coast Seed, S&S Seed, and Hedgerow Farms) and should have geographic and ecological origins as similar as possible to the project area. Seed lot documentation will be provided to the SMCP (for the Wunderlich County Park tree planting area) and SF Planning (for the tree planting in the ROW) for their review prior to seeding.

The proposed seed mix (Table 4) is based on species that are known to do well from seed on restoration sites, that will provide both immediate cover and long-term cover, and are appropriate for the site. The proposed seed mix is subject to change based on site conditions and seed availability. New seed mixes shall be approved by the PG&E biologist and SMCP before purchase and application. Seed lot tests will be included in annual monitoring reports.

Table 4. Suggested Contingency Seed Mix for the Wunderlich Restoration Site

SPECIES	PURE LIVE SEED (POUNDS/ACRE)
yarrow <i>Achillea millefolium</i>	1
California brome <i>Bromus carinatus</i> var. <i>carinatus</i>	8
blue wildrye <i>Elymus glaucus</i> subsp. <i>glaucus</i>	8
California poppy <i>Eschscholzia californica</i>	0.5
small fescue <i>Festuca microstachys</i>	8
purple needlegrass <i>Stipa pulchra</i>	8
blue eyed grass <i>Sisyrinchium bellum</i>	2
Total	35.5

Site Preparation

Prior to seeding, the soil surface in the bare soil areas will be scarified by lightly raking no deeper than two inches, in locations where the soil is compacted, to improve microtopography and prevent the seeds from washing away from the desired planting location.

Seed Application

Seeding may be implemented by hand broadcast seeding or hydroseeding as determined by the specific site's needs during restoration implementation.

Broadcast Seeding

Seeded areas can be broadcast seeded using a small hand-held mechanical broadcaster or by hand. A layer of protective mulch will be added to broadcast seeded areas, to conserve moisture, reduce soil erosion, and increase germination. Weed-free rice straw or hydromulch can be used as protective mulch. If straw is used, it will be applied at a rate of approximately 500 to 1,000 pounds per acre (depending on slope or exposure) and can be applied by hand or blown on.

Hydroseeding

The hydroseeding method uses the hydraulic application of a slurry of seeds, and mulch. Hydroseeding will be done according to the specifications below or as adjusted by the PG&E biologist. A 3-step application method will increase the likelihood that the seeds are in contact with the soil and are lightly overlain with mulch, which increases seeding success. Hydroseeding materials will be applied in separate applications in the approximate sequence as follows:

1. **Seed Application** - Apply the hydroseeding mixture with hydroseeding equipment at the rates indicated within 60 minutes after the seed has been added to the mixture. Apply seed at the specified rate (pounds per acre) along with 1,000 pounds per acre virgin wood cellulose fiber or equivalent. Wood fiber will be heat treated so it is invasive weed and pathogen free.
2. **Straw Application** - Apply straw at the rate of 0.5 to 1 ton per acre. Incorporation of straw will not be required. Distribute straw evenly without clumping or piling.
3. **Fiber and Tackifier Application** - Apply the following mixture with hydroseeding equipment at the corresponding rates: wood tackifier or equivalent at 500 pounds per acre and tackifier at 125 pounds per acre. The ratio of total water to total tackifier in the mixture will be as recommended by the manufacturer. Hydroseed materials must be applied so they are in contact with the ground surface. Fertilizer will not be added to the tackifier application.

Section 3. SUCCESS CRITERIA, ADAPTIVE MANAGEMENT, AND MONITORING

3.1. SUCCESS CRITERIA

The PG&E Restoration Biologist will be responsible for tracking, monitoring compliance, tracking success criteria, report generation, and agency reporting. Monitoring will be used to track the trend towards meeting the overall success criteria of the mitigation. Success criteria will be used to measure the success of the mitigation and to determine if it is on track to meet the final success criteria (Table 5). The final target for Wunderlich County Park is the average stocking rate of 1,600 native trees in the 16-acre off-site restoration site. For the temporary construction easement, a total of 124 trees must be stocked by the end of the 7-year monitoring period.

In both the onsite and offsite restoration areas, acorns and buckeyes will be planted at Year 0. During monitoring, annual assessments of the need for additional native tree planting will be conducted. PG&E will replace trees due to tree mortality and maintain a stocking rate of 100 trees per acre on average, as needed, throughout the Wunderlich County Park site. Dead trees in the TCE will be replaced up to annually to meet the target stocking of 124 trees.

Assessments will also include counts of recruitment. Native tree recruits will count towards meeting the Year 7 target stocking rate regardless of the species of recruit (as long as they are trees that are native to Wunderlich County Park). Care will be taken during *Eucalyptus* removal to ensure oak woodland species are preserved, to the extent feasible.

The success criteria included in Table 5 are to be met at the end of the 7-year monitoring period. If the target stocking rate is not met by the end of the monitoring period, additional adaptive management measures (such as tree planting and irrigation) and monitoring shall be required until the required number of trees are successfully established.

A discussion of the possible issues affecting restoration success (such as growth of invasive weeds, lack of recruitment, browsing, climatic conditions, depth of mulch, etc.) and adaptive management techniques to be employed are presented further in Section 3.3.

Table 5. Success Criteria and Monitoring Actions

PERFORMANCE INDICATOR	MONITORING ACTIVITY	TARGET VALUE IN MONITORING YEAR 2*	TARGET VALUE IN MONITORING YEAR 5*	TARGET VALUE IN MONITORING YEAR 7*	REMEDIAL ACTIVITY BASED ON THRESHOLD
On-site Planting Areas (Temporary Construction Easement)					
Number of Trees	Trees (planted and native natural recruits) will be counted during annual monitoring. Tree recruits, if native to the area, regardless of species, will count towards meeting the required 124 trees.	124 trees will be present in the restoration site.	124 trees will be present in the restoration site.	124 trees will be present in the restoration site.	Replanting will occur if 124 trees are not present in the restoration site in Year 7. Replanting may be conducted at any point during the 7 year monitoring period. Tree recruits, if native to the area, regardless of species, will count towards meeting the required 124 trees.
Health and Vigor	Tree health and vigor scores will be recorded during annual monitoring	None	None	None	Health and vigor scores will be used to help identify trends (e.g., if health and vigor scores drop substantially compared to the previous year, planning for contingency planting or irrigation as appropriate can occur). Health and vigor measures are not themselves success criteria, rather are used to identify appropriate remedial activities.
Photo-monitoring	Photo-monitoring at permanent photo points will be performed annually in the spring to document site progress as specified in the Vegetation Restoration Plan for each specific segment.	None	None	None	Photo-monitoring will document general site progress as well as tree growth and survivorship over time but will not be tied to success.
Invasive Weed Mapping and Control	Invasive Weed Mapping and Control will occur as specified in the Vegetation Restoration Plan for each specific segment.	Refer to Vegetation Restoration Plan for each specific segment.	Refer to Vegetation Restoration Plan for each specific segment.	Refer to Vegetation Restoration Plan for each specific segment.	Refer to Vegetation Restoration Plan for each specific segment.

PERFORMANCE INDICATOR	MONITORING ACTIVITY	TARGET VALUE IN MONITORING YEAR 2*	TARGET VALUE IN MONITORING YEAR 5*	TARGET VALUE IN MONITORING YEAR 7*	REMEDIAL ACTIVITY BASED ON THRESHOLD
Off-site Restoration Site (Wunderlich County Park)					
Number of Native Trees	Trees (planted and native natural recruits) will be counted during annual monitoring. Tree recruits, if native to the area, regardless of species, will count towards meeting the required number of trees.	The target average stocking rate of 100 TPA over 16 acres (1,600 trees) will be demonstrated	The target average stocking rate of 100 TPA over 16 acres (1,600 trees) will be demonstrated.	The target average stocking rate of 100 TPA over 16 acres (1,600 trees) will be demonstrated	Planting will occur if the native tree thresholds are not met by the end of Year 2, and in subsequent years if the site is not on track to meet Year 7 success criteria. Planting may be conducted at any point during the 7-year monitoring period. On an annual basis, PG&E will replace tree mortality and maintain stocking rate of 100 trees per acre on average, throughout the site. Tree recruits, if native to the area, regardless of species, will count towards meeting the required number of trees.
Health and Vigor	Tree health and vigor scores will be recorded during annual monitoring	None	None	None	Health and vigor scores will help identify trends (e.g., if health and vigor scores drop substantially compared to the previous year, planning for contingency planting can occur) that guide adaptive management but are not in themselves a success criterion.
Photo-monitoring	Photo-monitoring at permanent photo points will be performed annually in the spring to document site progress.	None	None	None	Photo-monitoring will document general site progress as well as tree growth and survivorship over time. This will help guide any adaptive management but is not in itself a success criterion.

PERFORMANCE INDICATOR	MONITORING ACTIVITY	TARGET VALUE IN MONITORING YEAR 2*	TARGET VALUE IN MONITORING YEAR 5*	TARGET VALUE IN MONITORING YEAR 7*	REMEDIAL ACTIVITY BASED ON THRESHOLD
<i>Eucalyptus</i> Control	Count and map the number of <i>Eucalyptus</i> re-sprouts annually	<i>Eucalyptus</i> sprouts will be controlled during the seven-year monitoring period following initial tree removal.	<i>Eucalyptus</i> sprouts will be controlled during the seven-year monitoring period following initial tree removal.	<i>Eucalyptus</i> sprouts will be controlled during the seven-year monitoring period following initial tree removal.	Observed <i>Eucalyptus</i> sprouts will be treated at least annually during the monitoring period
Invasive Weed Mapping and Control	Map the location of invasive weeds annually and identify weed control locations	Invasive weeds present in the planting area will be mapped and treated during an initial weed control effort. Any infestations of invasive weeds that occur outside of previously mapped areas or in greater abundance than noted in baseline surveys will be controlled. Any new invasive species will be controlled.	Invasive weeds present in the planting area will be mapped and treated during an initial weed control effort. Any infestations of invasive weeds that occur outside of previously mapped areas or in greater abundance than noted in baseline surveys will be controlled. Any new invasive species will be controlled.	Invasive weeds present in the planting area will be mapped and treated during an initial weed control effort. Any infestations of invasive weeds that occur outside of previously mapped areas or in greater abundance than noted in baseline surveys will be controlled. Any new invasive species will be controlled.	Invasive weeds listed in Appendix C or any new invasive weeds (as defined in Appendix C), will be controlled at least twice a year.

Notes: *Annual monitoring will be performed. Target thresholds are only provided for Years 2, 5, and 7. Annual monitoring will determine if the site is on track to meet target thresholds for Years 2, 5, and 7.

3.2. MONITORING

3.2.1 RESTORATION BIOLOGIST

All annual monitoring and reporting will be conducted under the direction of the PG&E restoration biologist. Monitoring staff will have a minimum of 5 years of experience working with habitat restoration.

3.2.2 MONITORING SCHEDULE

Restoration areas will be monitored for seven years (Table 6). Monitoring visits will occur quarterly for the first three years and then annually for the remaining four years of the monitoring period. Additional monitoring visits will be conducted as needed to ensure the site is on track to meet success criteria. Photo monitoring, tree counts, health and vigor data, and information on invasive weeds will be collected annually in all seven years. Monitoring will be sufficient to allow evaluation of the trajectory to meet success criteria contained in this plan. All monitoring visits will include a qualitative assessment of the need for remedial or maintenance activities including weed control, irrigation, pest control, or other activities.

Table 6. Monitoring Schedule

RESTORATION ACTION	IMPLEMENTATION YEARS (2018/2019)	YEAR 1 (2020)	YEAR 2 (2021)	YEAR 3 (2022)	YEAR 4 (2023)	YEAR 5 (2024)	YEAR 6 (2025)	YEAR 7 (2026)
Collect baseline data	X							
Collect seeds and acorns	X							
<i>Eucalyptus</i> tree removal	X							
Invasive weed treatments	X	X	X	X	X	X	X	X
Seed native seed mix (if necessary)	X	X*	X*	X*	X*	X*	X*	X*
Tree planting	X	X*	X*	X*	X*	X*	X*	X*
Hand weeding planting sites		X	X	X	X	X	X	X
Conduct quarterly site visits		X	X	X				
Collect annual monitoring data		X	X	X	X	X	X	X
Prepare Annual Monitoring Report		X	X	X	X	X	X	X

Notes: *Seeding of native seed mixes and tree planting will occur annually as necessary to keep the site on track to meet success criteria.

3.2.3 TREE COUNTS

The number of living planted trees and natural recruitment of native trees and will be counted annually. During monitoring visits, trees will be mapped using GPS, tagged in the field, and the species and size noted. Tree shelters may be installed to protect the trees from browse, provide shade, and increase soil moisture.

3.2.4 VEGETATIVE COVER MONITORING (OFF-SITE WUNDERLICH RESTORATION SITE ONLY)

As trees mature, estimates of cover may become a meaningful way to assess the progress of the restoration. Cover monitoring, if performed, will be collected to help identify ecological trends that would help guide adaptive management decisions and cover targets or thresholds are not proposed. Sampling will be carried out annually in the late spring or early summer and will be timed to ensure that vegetation is identifiable and has achieved its maximum growth.

Plant species composition and cover data will be collected using point-intercept transects that are 50 meters in length. Data collection points will be distributed evenly along the transect (every 50 cm) so the number of points along each transect are enough to provide adequate resolution of cover values. At each sampling point, species will be recorded, and if no vegetation is present then bare ground or mulch will be recorded. Approximately 32 transects will be placed in the restoration site. The restoration site will be divided into 16 1-acre subplots, and the transects will be located so that 2 transects are in each subplot, to ensure transects are evenly spaced throughout the site. Each 1-acre subplot will be divided into 2 half acre areas and 1 transect will be located in each half acre area for a total of 2 transects per acre subplot. This will ensure that the 2 transects per acre subplot do not cross and they will sample different areas. These transects will not be permanent, and new transects will be reestablished each year of monitoring. The transect will start along the acre-subplot edge and extend into the subplot. The exact start locations of transects along the edge of each subplot will be generated randomly in GIS. The direction of each transect (compass bearing in degrees) will be randomly generated using a random number generator, however only bearings will be used that allow the transect to stay within the acre subplot (and the half acre area that is being sampled).

The coordinates of the starting and ending points of each transect will be recorded using a GPS. Total cover contributed by natives, total cover contributed by non-natives, total cover contributed by invasive weed species, and other data as determined by the PG&E biologist will be calculated from this data.

3.2.5 TREE HEALTH AND VIGOR

Health and vigor scores will be recorded for a subset of trees within the restoration area. These data are qualitative and will be used to help guide decisions about future replanting, if needed, and are not themselves tied to project success. Results of health and vigor monitoring will be included in annual monitoring reports. For example, if tree health and vigor scores drop substantially in one year compared to previous years, acorns or seeds may be collected in the fall, or container stock contract-grown, in anticipation of future replanting. Additional discussion of possible issues and adaptive management techniques to address these are provided in Section 3.3. The general condition of each plant will be recorded using the following criteria:

- Excellent: No evidence of stress; minor pest or pathogen damage may be present; no chlorotic leaves; no or very minor herbivory
- Good: Some evidence of stress; pest or pathogen may be present; few chlorotic leaves (less than 10 percent); minor evidence of herbivory
- Fair: Moderate level of stress; high levels of pest or pathogen damage; some chlorotic leaves (between 10 and 30 percent); some herbivory damage such as nipped leaves, wear marks
- Poor: High level of stress; high levels of pest or pathogen damage; many chlorotic leaves (greater than 30 percent), severe herbivory damage

3.2.6 PHOTO MONITORING

Permanent photo-documentation points will be established in representative locations to document tree establishment and overall site progress. Additional photo points may be taken in representative areas and in potential problem areas where adaptive management is required. At each photo point, the location will

be recorded with GPS coordinates. Once per year in spring, photographs will be taken from each photo point.

3.2.7 EUCALYPTUS CONTROL (OFF-SITE WUNDERLICH RESTORATION AREA ONLY)

Eucalyptus re-sprouts or new seedlings will be counted and mapped during annual monitoring and controlled during the seven-year monitoring period following the initial tree removal. *Eucalyptus* re-sprouts will be controlled as described under 3.3, Adaptive Management.

3.2.8 INVASIVE WEED MAPPING

The restoration site will be surveyed and notes on invasive weed species present and location will be recorded. The location of weeds observed will be mapped. These notes and photos will be used to assess the need for invasive species control and direct control activities.

3.3. MONITORING REPORT

At the end of each monitoring year, an annual report will be prepared that includes methods used, results of monitoring, photo monitoring photographs, representative photographs, a summary of data including tree survivorship, health and vigor of the trees, an assessment of progress toward meeting the native woodland cover criterion, discussion of any adaptive management actions taken, recommendations, and implemented actions.

Annual monitoring reports will be sent to SMCP (Wunderlich County Park restoration site only), SF Planning and CDFW by February 28 of the following year. Data from the quarterly site visits will be provided to SMCP NRM staff and made available to other agencies within one month of the end of each quarter.

3.4. ADAPTIVE MANAGEMENT AT OFF-SITE WUNDERLICH RESTORATION AREA

Adaptive management actions will be performed if the off-site restoration site at Wunderlich is failing to meet any of the above listed success criteria as observed during monitoring visits, or if results of monitoring raise concerns about potentially meeting the target number of trees at the end of the monitoring period. Specific adaptive management actions will be determined by the PG&E Biologist, with guidance from a restoration ecologist, SMCP NRM staff, and forester, in consultation with CDFW, based on the identified or suspected issues. Adaptive management and remedial actions for on-site plantings in the temporary construction easement at each segment will follow the Vegetation Restoration Plan for that segment.

Issues that could affect the degree or timeline for restoration will be noted during monitoring. These can include factors such as growth of invasive weeds; herbivory (deer, gophers, insects); disease; climatic factors or events such as drought or fire; failure of irrigation where provided; too much or too little mulch. Potential adaptive management actions to address the potential factors are shown in Table 7; others may be identified by the restoration biologist depending on site- and event-specific factors that appear to have affected the restoration progress.

All monitoring visits will include an evaluation of the need for adaptive management if necessary. Adaptive management measures will be implemented as determined necessary to meet restoration goals as prescribed by the PG&E Biologist/Land Planner.

Table 7. Adaptive Management Actions

ADAPTIVE MANAGEMENT ACTION	DESCRIPTION	LOCATION
Adjust mulch to increase native recruitment	If <i>Eucalyptus</i> mulch has been applied too thickly, mulch may be thinned or removed to increase natural recruitment	Wunderlich County Park
Evaluation of browse pressure	If recruitment is low, or browse damage is noted, an evaluation of temporary fencing will be performed, and fencing or plant protection installed as needed	Wunderlich County Park and TCE
Supplemental Planting of Trees (Seeds, Acorns, or Container Stock)	Selective planting of native tree species may be performed.	Wunderlich County Park and TCE
Irrigation	Irrigation water will be applied to plantings as necessary to maximize survivorship.	Wunderlich County Park and TCE
Tree Replacement	Dead trees or non-germinating acorns or direct seeding will be replaced as necessary to maintain a 100 TPA stocking rate (or the select number of trees approved in the case of the TCE)	Wunderlich County Park and TCE
Invasive Weed Control	Selective herbicide treatments, hand weeding, or other mechanized weeding treatments may be performed to reduce the prevalence of non-native invasive plant species.	Wunderlich County Park and TCE
<i>Eucalyptus</i> Sprout Follow-Up Treatment	Following the initial <i>Eucalyptus</i> removal at the Wunderlich County Park restoration site, all cut re-sprouts and new seedlings would receive semiannual follow-up treatment of herbicides (Garlon 4 Ultra or a mixture of Garlon 4 Ultra and RoundUp) to ensure <i>Eucalyptus</i> is controlled in the restoration site.	Wunderlich County Park
Seeding of a Native Seed Mix	A native seed mix may be spread in bare soil areas disturbed by tree removal or to increase native cover.	Wunderlich County Park

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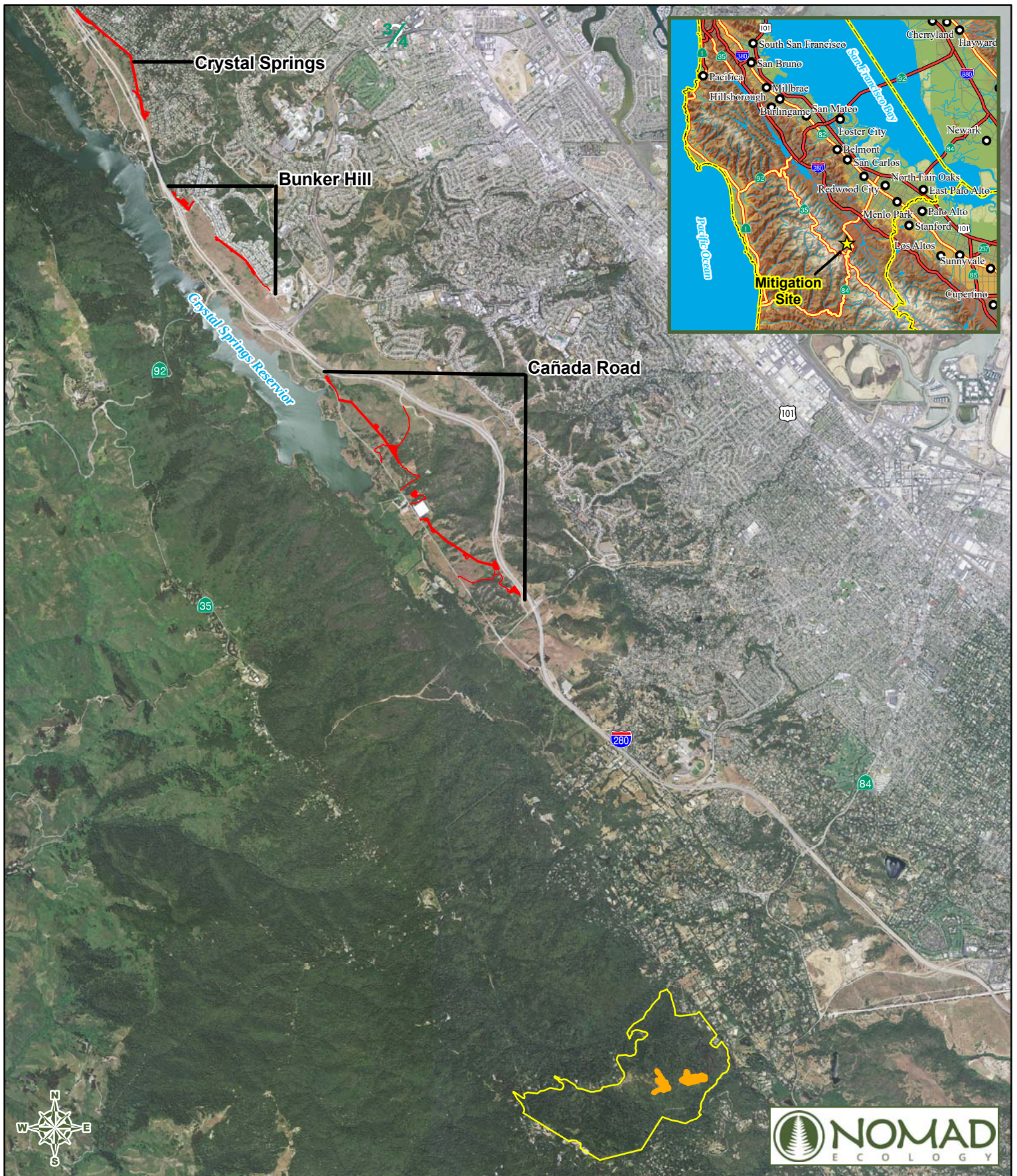
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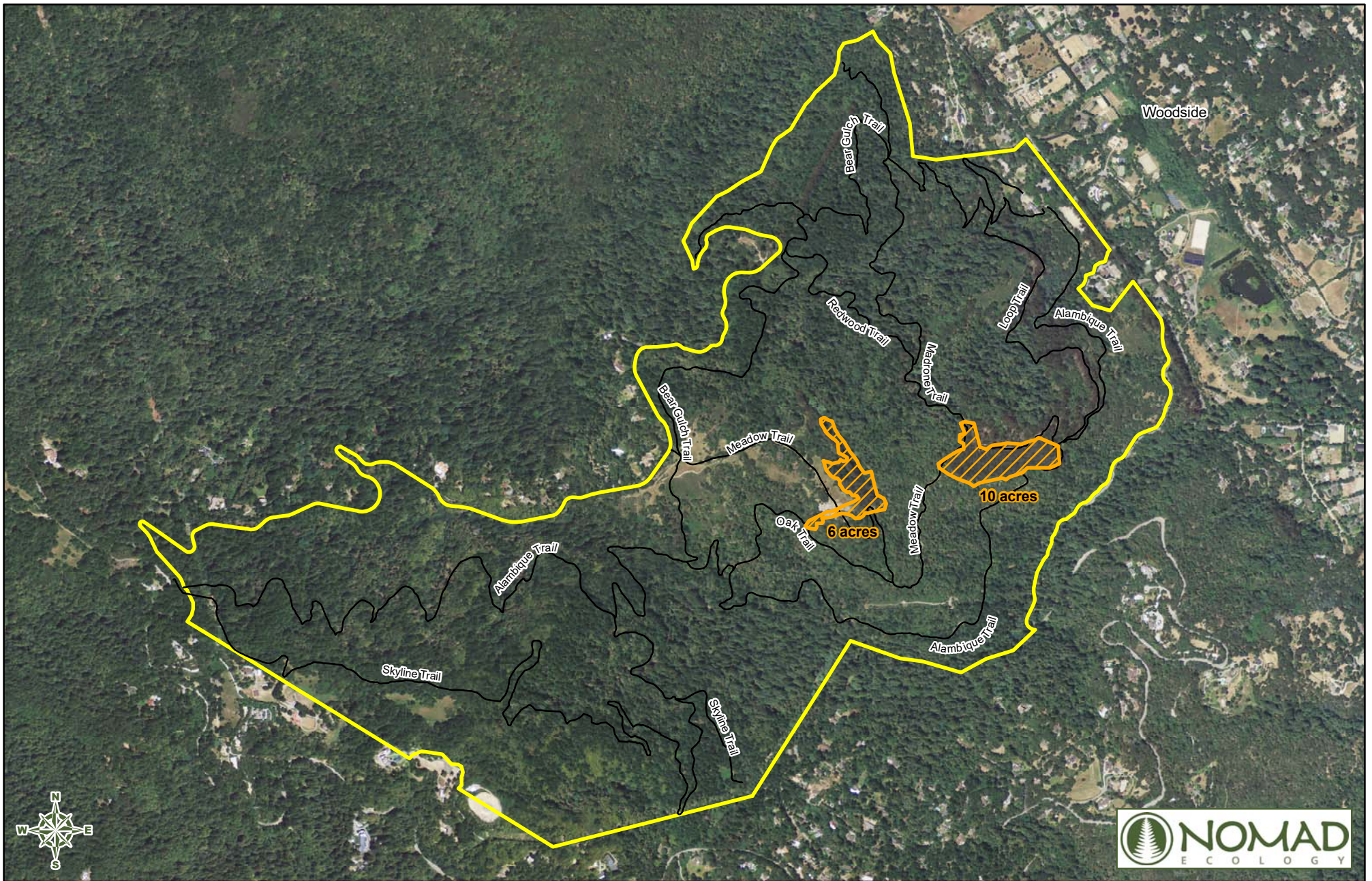
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APPENDIX A FIGURES



September 2018

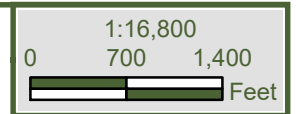
Figure 1
Location of the GL 109 Projects and Mitigation Site
 GL109 Mitigation and Monitoring Plan
 Pacific Gas & Electric

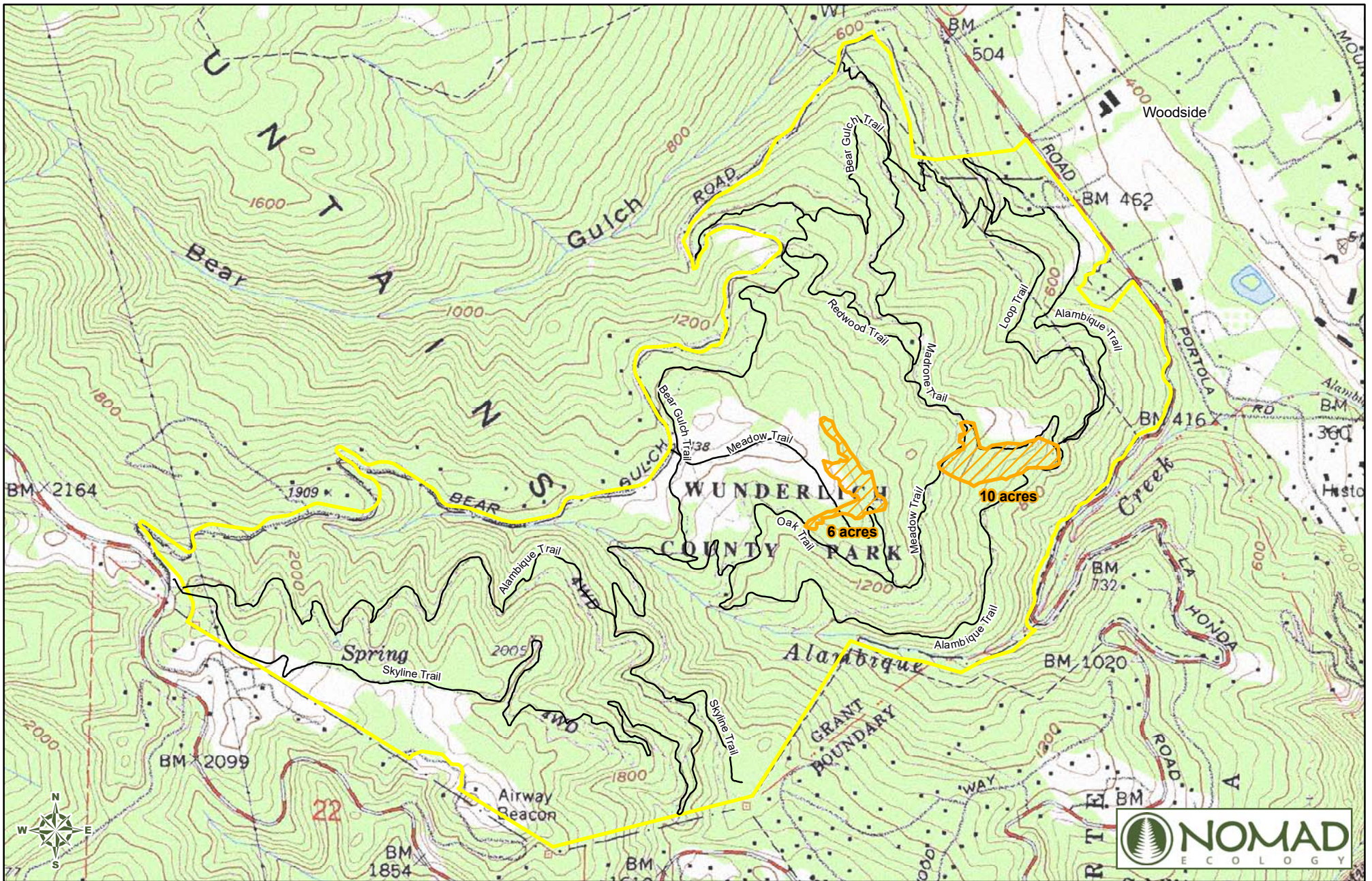


September 2018

Legend	
	Wunderlich County Park
	Park Trails
	Mitigation Sites

Figure 2
Mitigation Sites
 GL109 Mitigation and Monitoring Plan
 Pacific Gas & Electric

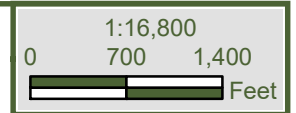


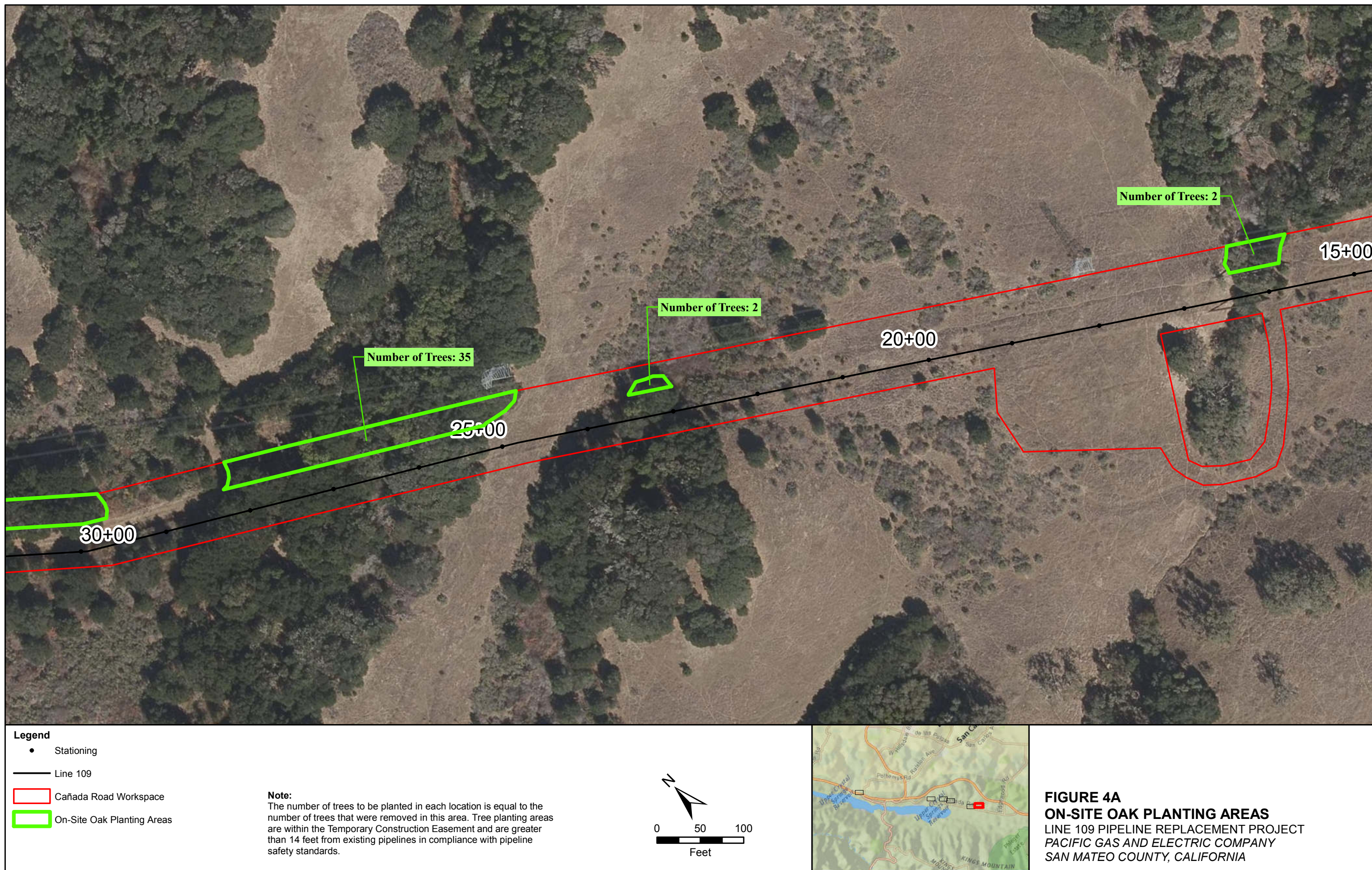


September 2018

Legend	
	Wunderlich County Park
	Park Trails
	Mitigation Sites

Figure 3
Topography of Wunderlich County Park
 GL109 Mitigation and Monitoring Plan
 Pacific Gas & Electric







Legend

- Stationing
- Line 109
- Cañada Road Workspace
- On-Site Oak Planting Areas

Note:

The number of trees to be planted in each location is equal to the number of trees that were removed in this area. Tree planting areas are within the Temporary Construction Easement and are greater than 14 feet from existing pipelines in compliance with pipeline safety standards.

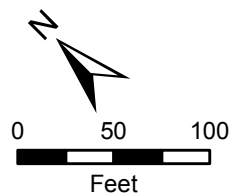


FIGURE 4B
ON-SITE OAK PLANTING AREAS
 LINE 109 PIPELINE REPLACEMENT PROJECT
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN MATEO COUNTY, CALIFORNIA



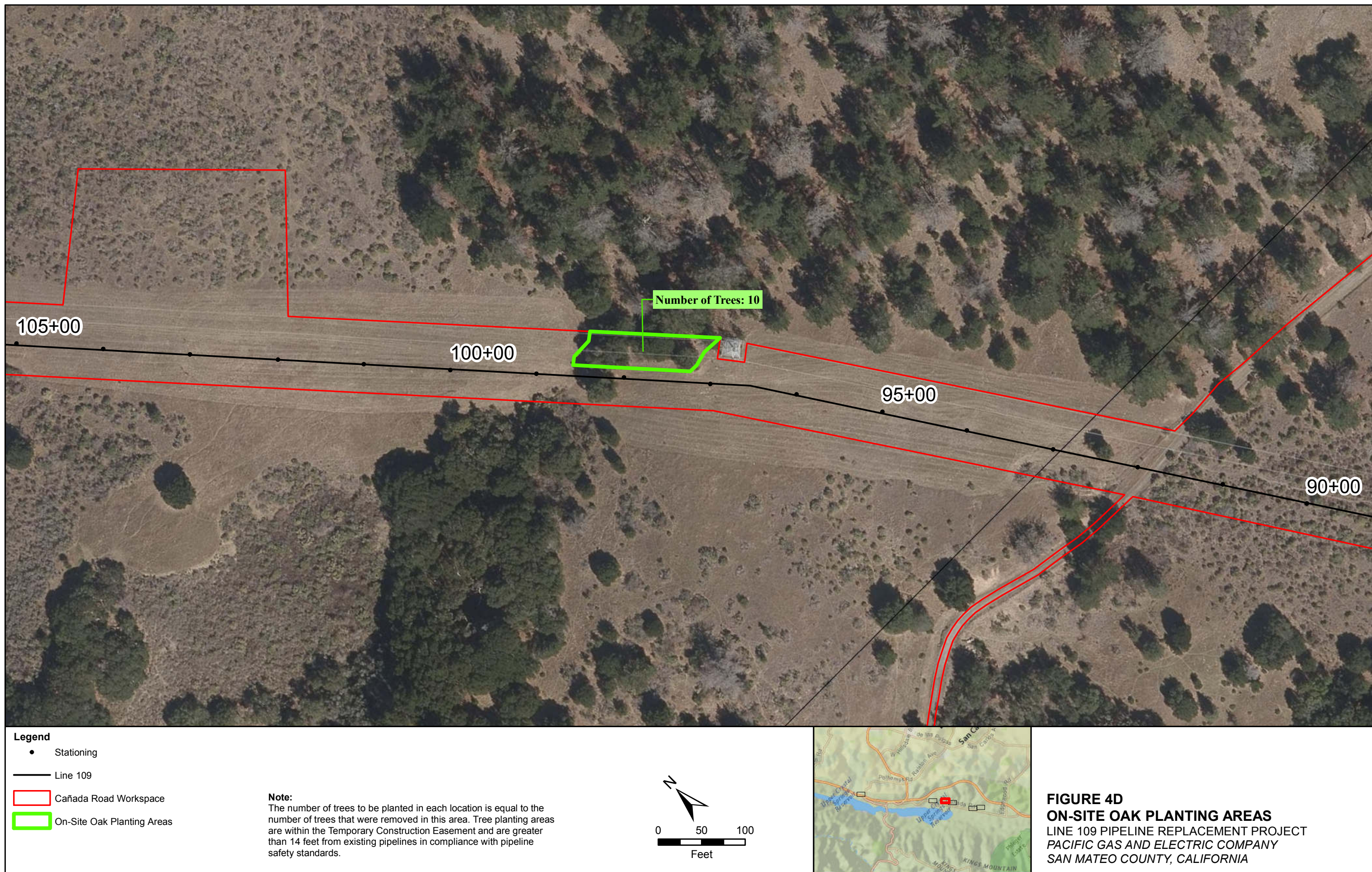
Legend

- Stationing
- Line 109
- Cañada Road Workspace
- On-Site Oak Planting Areas

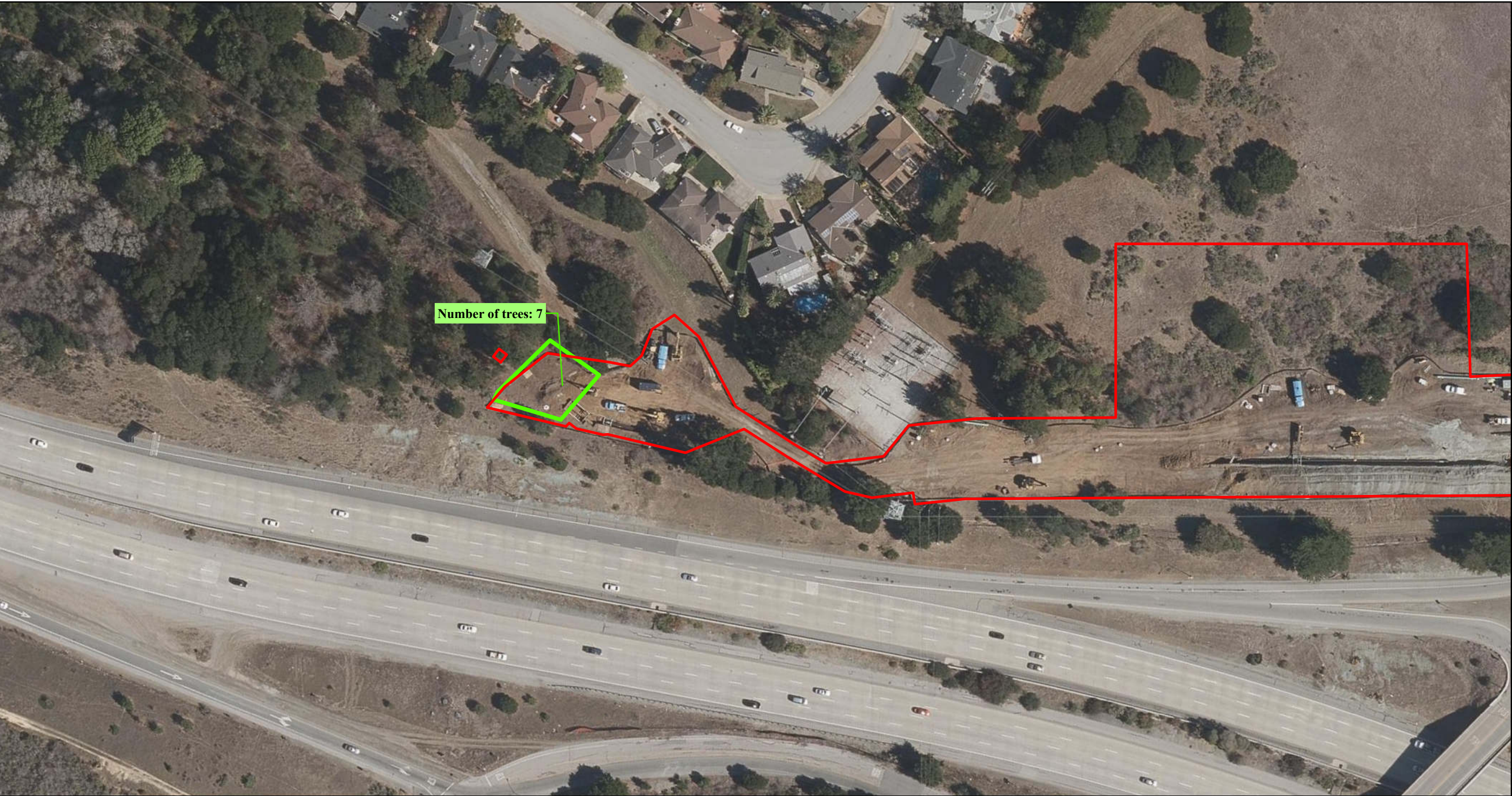
Note:
The number of trees to be planted in each location is equal to the number of trees that were removed in this area. Tree planting areas are within the Temporary Construction Easement and are greater than 14 feet from existing pipelines in compliance with pipeline safety standards.

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Feet

FIGURE 4C
ON-SITE OAK PLANTING AREAS
LINE 109 PIPELINE REPLACEMENT PROJECT
PACIFIC GAS AND ELECTRIC COMPANY
SAN MATEO COUNTY, CALIFORNIA







Legend

- Stationing
- Line 109
- Bunker Hill Workspace
- On-Site Oak Planting Areas

Note:
The number of trees to be planted in each location is equal to the number of trees that were removed in this area. Tree planting areas are within the Temporary Construction Easement and are greater than 14 feet from existing pipelines in compliance with pipeline safety standards.

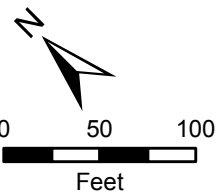


FIGURE 4F
ON-SITE OAK PLANTING AREAS
LINE 109 PIPELINE REPLACEMENT PROJECT
PACIFIC GAS AND ELECTRIC COMPANY
SAN MATEO COUNTY, CALIFORNIA

APPENDIX B WUNDERLICH COUNTY PARK BACKGROUND AND PHOTOGRAPHS

OVERVIEW

The proposed offsite mitigation would occur at Wunderlich Park, in Woodside California, a public property that is owned and managed by SMCP. Wunderlich County Park is approximately 932 acres in size. Wunderlich County Park is west of Highway 84 (Woodside Road) and east of Highway 35 (Skyline Boulevard) in the vicinity of the town of Woodside, CA (Figure 1). The park is located approximately 4 miles south of the nearest L109 project segment – 4A1 Cañada Road. It is bordered by the town of Woodside to the northeast, and very low density residential development to the north, south, and west. Open space is present in the vicinity to the north, south, and west. Two sites at Wunderlich County Park are available for tree planting: 1) a 10-acre site, and 2) a 6-acre site (Figure 2, Appendix A). A total of 14 acres will be stocked according to forest practice rules at 100 TPA. The additional two acres at Wunderlich County Park will be logged to remove *Eucalyptus* but will not be planted. Natural recruitment will be enhanced through application of herbicide controls to control invasive species. This will allow for natural regeneration and has been added to increase mitigation requirements for temporal loss of habitat.

As described in the *Ecological Subregions of California* (USDA 1997), the Wunderlich restoration site and the L109 projects are located within the Santa Cruz Mountains subsection of the Central California Coast section. Both the L109 projects and the tree planting mitigation sites are within the San Francisco Bay Area (SnFrB) Jepson ecoregion. The restoration sites are in the watershed of Alambique Creek.

Wunderlich Park serves a variety of public uses, including recreational activities such as hiking and equestrian trails. Wunderlich Park contains a diversity of vegetation communities including oak madrone woodlands, open meadows, and redwood groves. In addition to being used for recreation, the park supports a variety of native wildlife including bobcats, mountain lions, and nesting birds. Introduced plant species including blue gum eucalyptus, acacia, and pine occur in large contiguous patches throughout the park in areas that were historically oak-madrone woodlands. These non-native stands not only compromise native species richness and diversity but represent a significant fire risk to the SMCP and adjacent communities. SMCP has been active in removing *Eucalyptus* hazard trees for fire suppression and restoration purposes in Wunderlich Park, but budgetary constraints have limited the extent of non-native tree removals and exotic species control that is desired by the community and SMCP.

In addition to the need for tree restoration at Wunderlich Park, the park is a desirable location to implement a restoration project. The park is maintained as a permanent conservation area. Existing trails/roads are available for vehicle travel to and from the tree planting mitigation sites and adjacent/nearby meadows previously used by the SMCP as staging areas for fire suppression and emergency activities could provide space for staging equipment and materials during project implementation. As the SMCP owns and manages the park, after PG&E satisfies tree monitoring requirements in compliance with the MND, the tree planting mitigation site would continue to be monitored and maintained by the SMCP. Details of this arrangement would be established in a Memorandum of Understanding (MOU) document or a similar agreement.

BASELINE CONDITIONS EVALUATION AT WUNDERLICH COUNTY PARK

Nomad Ecology, LLC (Nomad) restoration ecologists Erin McDermott and Jaclyn Inkster visited the Wunderlich County Park restoration site on January 10, 2018 with Bobby Vogt, Senior Biologist of PG&E to assess site conditions and plan the restoration. A second site visit was conducted by Ms. Inkster on February 14, 2018. Weeds were assessed on August 30, 2018. General observations were recorded on plant species present (including native species, non-native species, and invasive weeds), tree size and density, slope, thickness of *Eucalyptus* duff, and other environmental information. Nearby areas in the park where blue gum eucalyptus trees had been removed were visited to record native species and

invasive weeds colonizing the sites. Adjacent oak woodland areas were visited to record plant species and composition to use as a reference site for the tree planting. On June 19, 2018, Erin McDermott and Jaclyn Inkster collected tree density data from oak woodlands in the park.

TOPOGRAPHY AND SOILS

Topography within the restoration sites is characterized as a steep slope ranging from 800-1,120 feet in elevation over 1,100 feet. Annual average rainfall is approximately 32-36 inches (PRISM 2015). One soil mapping unit is located within the restoration site: Alambique-McGarvey complex, 30 to 75 percent slopes which are moderately acidic (5.1-7.5 pH) (NRCS 2018). The sites are upland, and more than 500 feet away (immediately uphill) from Alambique Creek.

TREE PLANTING AREA

A total of 16 acres at Wunderlich will be selected for restoration. The 16 acres will be stocked according to forest practice rules at 100 TPA. Natural recruitment will be enhanced through application of herbicide controls to control invasive species. This will allow for natural regeneration and has been added to increase mitigation requirements for temporal loss of habitat.

The 10-acre restoration site is bordered by the Meadow Trail to the north and west, and the Alambique Trail to the east. It is characterized by dense blue gum *Eucalyptus* forest, comprising trunks primarily in the 3 to 32 inches DBH range. The understory consisted of dense blue gum *Eucalyptus* duff; however, scattered native understory species were present including toyon (*Heteromeles arbutifolia*), California bay (*Umbellularia californica*), coast live oak (*Quercus agrifolia* var. *agrifolia*), honeysuckle (*Lonicera hispidula*), common rush (*Juncus patens*), foothill needle grass (*Stipa lepida*), sticky monkeyflower (*Mimulus aurantiacus* var. *aurantiacus*), California blackberry (*Rubus ursinus*), climbing bedstraw (*Galium porrigens* var. *porrigens*), blue wild rye (*Elymus glaucus*), Pacific hound's tongue (*Cynoglossum grande*), madrone (*Arbutus menziesii*), yerba buena (*Clinopodium douglasii*), and tanoak (*Notholithocarpus densiflorus* subsp. *densiflorus*).

The 6-acre tree planting area is accessed via the Meadow Trail. It is characterized by open blue gum *Eucalyptus* forest, with fewer, larger trees (14-48 inches DBH range) than the 10-acre site. Large blue gum *Eucalyptus* trees had been removed from the road side, and stump sprouts were present. Native species observed in the understory include toyon, California blackberry, coast live oak seedlings, yerba buena, coyote brush (*Baccharis pilularis* subsp. *consanguinea*), Douglas' iris (*Iris douglasiana*), Pacific sanicle (*Sanicula crassicaulis*), California bay, Douglas-fir (*Pseudotsuga menziesii*), and blue wild rye. Non-native species included rattlesnake grass, bull thistle (*Cirsium vulgare*), and Italian thistle (*Carduus pycnocephalus* subsp. *pycnocephalus*). French broom (*Genista monspessulana*), and Scotch broom (*Cytisus scoparius*) were present in a dense stand at the western edge, where the blue gum *Eucalyptus* forest bordered grassland that was invaded by these two broom species.

NON-NATIVE SPECIES OBSERVED

Non-native species observed (besides *Eucalyptus*) include Monterey cypress (*Hesperocyparis macrocarpa*), Monterey pine (*Pinus radiata*), French, periwinkle (*Vinca major*), rattlesnake grass (*Briza maxima*), Bermuda buttercup (*Oxalis pes-caprae*), bristly dogtail grass (*Cynosurus echinatus*), and crane's bill geranium (*Geranium molle*). Most of the understory species are found in more canopy open areas, and along the bordering trails. The dense inner *Eucalyptus* forest supports very little understory. Adjacent vegetation communities (as mapped by SMCP) include mixed evergreen forest. Invasive weeds observed are discussed in more detail below.

INVASIVE SPECIES OBSERVED

Several invasive weed species, including Italian thistle, bull thistle, Scotch broom, Bermuda buttercup, periwinkle, and French broom, were observed in the two tree planting sites at Wunderlich County Park during a site visit on January 11, February 14, and August 30, 2018 (Table 3). It is not expected that this

project will fully eradicate these persistent species with a long-lived (100 year or more) seed bank, however steps will be taken to limit further spread of invasive weeds. Other species may be present as the sites were not surveyed thoroughly.

Prior to *Eucalyptus* tree and noxious weed removal, comprehensive baseline weed mapping at the mitigation site will be performed.

Invasive Weeds Observed in the Wunderlich County Park Tree Planting Area

SPECIES NAME	COMMON NAME	CAL-IPC	CDFA	FAMILY
<i>Acacia dealbata</i>	silver wattle	Moderate	---	Fabaceae
<i>Brachypodium distachyon</i>	false brome	Moderate	---	Poaceae
<i>Carduus pycnocephalus</i> subsp. <i>pycnocephalus</i>	Italian thistle	Moderate	On List	Asteraceae
<i>Centaurea solstitialis</i>	yellow star thistle	High	On List	Asteraceae
<i>Cirsium vulgare</i>	bull thistle	Moderate	On List	Asteraceae
<i>Conium maculatum</i>	poison hemlock	Moderate	---	Apiaceae
<i>Cotoneaster lacteus</i>	milkflower cotoneaster	Moderate	---	Rosaceae
<i>Cytisus scoparius</i>	scotch broom	High	On List	Fabaceae
<i>Dittrichia graveolens</i>	Dittrichia	Moderate	---	Asteraceae
<i>Ehrharta erecta</i>	panic veldt grass	Moderate	---	Poaceae
<i>Genista monspessulana</i>	French broom	High	On List	Fabaceae
<i>Hedera helix</i>	English ivy	High	---	Araliaceae
<i>Oxalis pes-caprae</i>	bermuda buttercup	Moderate	---	Oxalidaceae
<i>Vinca major</i>	periwinkle	Moderate	---	Apocynaceae

Notes:

Prior to *Eucalyptus* tree and noxious weed removal, comprehensive baseline weed mapping at the mitigation site will be performed.

Cal-IPC Weed Ranking Definitions:

High: These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate: These species have substantial and apparent - but generally not severe - ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited: These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic (Cal-IPC 2018).

CDFA Species Definition

Species considered a noxious weed by CDFA are listed on the California Noxious Weed List (CDFA 2018).



Photo 1. Tree planting area at Wunderlich County Park showing density of trees and lack of understory.



Photo 2. Tree planting area at Wunderlich County Park, showing the density of trees.



Photo 3. Tree planting area at Wunderlich County Park showing the size and density of tree and understory of native toyon

APPENDIX C

INVASIVE WEED BMPs

These Invasive Weed Best Management Practices are based on *Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers* (Cal-IPC 2012) and modified slightly to be project specific.

- Prevention training will be provided to staff and tree removal and tree planting contractors prior to starting work. Invasive weed identification and avoidance measures will be included in the preconstruction environmental tailboard meeting. The training will include field identification of invasive plants in the project area, reproductive biology of invasive plants, and invasive plant prevention Best Management Practices. The training will also include a summary of *Phytophthora*, its issues, spread, and Best Management Practices. The biological monitor will ensure that contractors understand provisions for invasive and non-native plant prevention and soil borne pathogen spread prevention throughout the project. Invasive and non-native plant and soil borne pathogen considerations will be routinely addressed during regular tailboard meetings. The monitoring biologist shall ensure that all staff have participated in the training by establishing and keeping a sign- in sheet that will record attendees.
- A site assessment for invasive plant infestations will be conducted before carrying out field activities. Data will be collected on populations of invasive weed species in the work area and along trails and access roads during pre-construction surveys. Data to be collected includes the extent and location of target invasive weed species, and an abundance estimate within the extent boundaries. All weeds on the CDFA noxious weed list as well as Cal-IPC species with a rank of High and Moderate will be surveyed for and mapped. Baseline invasive weed mapping will occur in the tree planting areas prior to the beginning of invasive species removal and *Eucalyptus* removal at Wunderlich County Park.
- Cleaning BMPs will be integrated into the project. All equipment and material arriving on site will be clean and free of soils and plant material except for materials such as coir or fiber rolls which are made with plant material themselves; those will be kept clean of foreign plant material and soils. At least one wash station will be established near the temporary construction easement tree planting areas and for Wunderlich County Park tree planting area in the main parking lot off Woodside Road near the tree planting area access point. Contractor vehicles and equipment that have been used or driven off-road prior to arriving at the proposed project sites will be cleaned upon arriving at the on- site wash station before entering further into the work site, to minimize bringing invasive weed propagules, plant pathogens, insects, and soil from elsewhere onto the project. The construction workers will also brush off soil and plant material off their boots at the wash station and decontaminate with quaternary ammonia solution or Isopropyl alcohol (70-90). Vehicles as described that require washing will not access the work site without using the wash. The monitoring biologist will verify the condition of the equipment and vehicles for proper cleaning before entering the project site. In compliance with the L109 project's MND, vehicle cleaning will remove soil, seeds, and plant parts from the undercarriage, tires, sideboards, tailgates, and grills of all vehicles and equipment.
- There will be a designated cleaning area for tools, equipment, and vehicles. Tools, equipment, and vehicles will be inspected and cleaned before entering and leaving the worksite.

- All construction material sources will be weed-free. Only rice straw or weed-free straw or fiber roll logs will be used.

Travel routes will be planned to reduce the risk of invasive plant spread. Invasive weeds listed in Table 2 will be controlled along travel routes to prevent the spread in the park along roads and in the tree planting areas by equipment.

- Invasive plants in the tree planting areas will be controlled prior to *Eucalyptus* removal (at Wunderlich County Park) and tree planting in the Wunderlich County Park and in the tree planting areas in the temporary construction easement to avoid spreading them throughout the tree planting area. When disposing of invasive plant material offsite, the material will be contained during transport.
- The soil surface will be disturbed the minimum amount necessary to complete tree removal and replanting activities, which will reduce ground disturbance and consequently will help minimize the proliferation of invasive weeds. A thin layer of mulch (4-6 inches in depth from bare mineral soil) will be spread on portions of the site to provide the well documented benefits of mulch (weed suppression, improved water relation, etc.). The mulch will be comprised of *Eucalyptus* duff and chipped *Eucalyptus* wood chips. Any disturbed bare ground areas not mulched will be seeded.
- Noxious weeds such as scotch broom and French broom are present and are expected to emerge from the seed bank for several years following tree removal. To successfully accomplish the noxious weed and tree removal, continued monitoring and removal will be needed.
- *Eucalyptus* trees will need to be treated with herbicides throughout the monitoring period to remove re-sprouting trees.

APPENDIX D

GUIDELINES TO MINIMIZE *PHYTOPHTHORA* CONTAMINATION IN RESTORATION PROJECTS (*PHYTOPHTHORA* WORKING GROUP)

Guidelines to Minimize *Phytophthora* Contamination in Restoration Projects

These guidelines aim to avoid contamination of restoration sites with exotic pathogenic *Phytophthora* species or other plant pathogens during planting and related activities.

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Definitions:

- **Holding facility or nursery:** A facility where nursery stock is maintained for a short to extended period of time prior to planting. Plant maintenance activities may include irrigation, fertilization or light pruning, as necessary. Nurseries involved in most other activities, including propagation or repotting are considered production nurseries.
- **Job site:** The job site includes areas for planting, soil stockpiling, parking, and access roads within and leading to the site.
- **Nursery stock:** All types of nursery grown plants.
- **Planting area:** Area being planted for habitat restoration, erosion control, or other purposes.
- **Planting site:** An individual planting basin or other spot, typically no larger than one square yard, where an individual plant or several grouped plants will be installed.
- **Sanitize:** Clean and treat with a sanitizing agent or via a lethal heat exposure to kill plant pathogens present as external contamination.
- **Sanitizing agent:** Materials such as bleach (sodium hypochlorite solutions), alcohol, quaternary ammonium compounds, and peroxides that can directly kill exposed propagules of *Phytophthora* or other plant pathogens when used properly. Most sanitizing agents can also kill a wide variety of bacteria and deactivate many viruses. Note that most materials referred to as fungicides are applied to plants to suppress disease but may not kill the pathogens and are not sanitizing agents.

I. Construction projects

In an effort to minimize the spread of plant pathogens the exterior and interior of all equipment and tools must be clean and free of debris, soil and mud (including tires, treads, wheel wells and undercarriage) prior to arrival at a new job site.

General guidance – suggested standard operating procedures:

- a. Vehicles need to stay on established roads unless infeasible.
- b. In general, vehicles and equipment need to be maintained clean – interior and exterior free of mud, debris and soil especially during the wet season.
- c. In general, work shoes need to be kept clean- inspect shoe soles and knock mud, debris and soil off treads before moving to a new job site.
- d. To minimize the potential for spreading potentially contaminated soil and time required for decontamination, if possible, avoid vehicle traffic and field work when soils are wet enough to stick readily to shoes, tools, equipment and tires.

II. Planting at Field Sites

Overview: Three general routes for the spread of *Phytophthora* and other soilborne plant pathogens are addressed in these guidelines. These routes are (1) contamination of planting material, including clean nursery stock, and other materials installed at the site, (2) inadvertent introduction of pathogens to a job site from other outside sources (e.g., via contaminated equipment), and (3) potential movement of undetected contamination within the planting area.

These guidelines assume that all nursery stock was originally grown under phytosanitary conditions and tested as remaining free from disease in the nursery (refer to nursery guidelines). These guidelines address how to protect the planting area from subsequent contamination during the delivery, storage onsite, and installation of planting stock and materials.

1. Prevent contamination of clean nursery stock or other clean plant materials

Planting stock shall be protected from potential contamination from the point that it leaves the production nursery or collection site until planting. Note that nursery stock has a high risk of infection by *Phytophthora* species if exposed to these pathogens. Excluding these pathogens provides the only viable option for maintaining outplanted nursery stock free of *Phytophthora*.

1.1. Maintaining nursery stock in a holding facility

When holding stock for an extended period (after delivery from production nursery and before planting), the following practices need to be followed to prevent contamination of the nursery stock with *Phytophthora*.

- 1.1.1. Delivered nursery plants that will be held before planting shall be transferred to cleaned and sanitized raised benches and maintained as described in “Guidelines to Minimize *Phytophthora* Pathogens for holding (non-production) nurseries at restoration sites, Section 3.”

1.2. Handling and transporting nursery plants at the job site

- 1.2.1. Nursery plants shall be transported on or in vehicles or equipment that have been cleaned before loading the stock. Truck beds, racks, or other surfaces need to be swept, blown with compressed air and/or power washed as needed so they are visibly free of soil and plant detritus. More information on sanitizing surfaces are described in the Appendix.
- 1.2.2. Keep plants in sanitized vehicles or on sanitized carts, trailers, etc. until delivered to their planting sites. (More information may be found in sections 1.3.3. and 1.3.4.)
- 1.2.3. At the job site, plants shall be handled to prevent contamination until delivered to each planting site. Nursery stock shall not be placed on the soil or other potentially contaminated surfaces until they are placed at their specific planting sites.
- 1.2.4. If it is necessary to offload plants at the job site, plants may be placed on clean waterproof plastic tarps or other clean, sanitized surfaces. If tarps are used for holding plants, one surface needs to be dedicated for contact with nursery stock and will be cleaned and sanitized to maintain phytosanitary conditions.

1.3. Other planting site inputs

- 1.3.1. Washing, soaking, or irrigation of plant material shall be conducted using clean water sources as specified in the Appendix below. Untreated surface waters should not be used for these purposes.
- 1.3.2. On-site or off-site collection of plant materials, including seed and cuttings for direct planting, shall be conducted in a phytosanitary manner (see guidelines for collection practices at www.calphytos.org).
- 1.3.3. Prior to delivery to the planting areas, mulch, compost, soil amendments, inoculants, and other organic products need to be examined and determined to be low-risk for pathogen introduction. Acceptable materials are those that are free of contamination by plant pathogens based on their composition or manufacturing conditions, or that have been exposed to an effective heat treatment to eliminate pathogens. Such materials must be handled and stored in a manner that prevents contamination. At the job site, delivered materials shall be handled to prevent contamination until delivered to each planting site in the same manner specified for nursery stock in section 1.2 above.
- 1.3.4. All other materials to be installed at the site shall be of new or sanitized material that has not been stored in contact with soil, untreated surface waters, or other potentially contaminated materials. This includes irrigation supplies (such as pipe, fittings, valves, drip line, emitters, etc.), erosion control fabrics, fencing, stakes, posts, and other planting site inputs.

2. Cleaning and sanitation required before entering planting area to prevent introducing contamination from other locations

Phytophthora contamination can be present in agricultural and landscaped areas, in commercial nursery stock, and in some infested native or restored habitat areas. Contamination can be spread via soil, plant material and debris, and water from infested areas. Arriving at the site with clean vehicles, equipment, tools, footwear, and clothing helps prevent unintentional contamination of the planting site from outside sources.

2.1. Vehicles, equipment, and tools

- 2.1.1. Equipment, vehicles and large tools must be free of soil and debris on tires, wheel wells, vehicle undercarriages, and other surfaces before arriving at the planting area. A high pressure washer and/or compressed air may be used to ensure that soil and debris are completely removed. Vehicles that only travel and park on paved roads do not require external cleaning.
- 2.1.2. The interior of equipment (cabs, etc.) should be free of mud, soil, gravel and other potentially contaminated material. Interiors should be vacuumed, washed, and/or treated with sanitizing agents as needed to eliminate pathogen propagules that could be transferred to the planting area.
- 2.1.3. Small tools and other small equipment (including hoses, quick couplers, hose nozzles, and irrigation wands) need to be washed to be free of soil or other contamination and sanitized (see Appendix).
- 2.1.4. Hoses shall be new or previously used only for clean water sources (see Appendix).

2.2. Footwear and clothing

- 2.2.1. Soles and uppers of footwear need to be visibly free of debris and soil before arriving at the planting area. (See the Appendix for more details.)
- 2.2.2. At the start of work at each new job site, worker clothing shall be free of all mud, soil or detritus. If clothing is not freshly laundered, all debris and adhered soil should be removed by brushing with a stiff brush.
- 2.2.3. Gloves and non-porous knee pads must be new (if disposable) or laundered/sanitized at the start of each work day, and/or clean coveralls must be worn. Non-disposable gloves should be made of or coated with material, such as nitrile, that can be sanitized.

3. Prevent potential spread of contamination within planting areas

Phytophthora can also be spread within plantings areas if some portions of the site are contaminated. However, it is not possible to identify every portion of a planting area that may contain *Phytophthora*. Because *Phytophthora* contamination is not visible, working practices should minimize the movement of soil within the planting area to reduce the likelihood of pathogen spread.

Note that areas with higher risk of *Phytophthora* infestation include areas adjacent to planted landscaping, areas previously planted with *Phytophthora*-infected stock, areas with existing or recently removed woody vegetation, disturbed wetlands, and areas directly along watercourses. Areas with low risk of contamination typically include upland sites with only grassy vegetation or sites where surface soils have been removed.

3.1. Worker training and site access

- 3.1.1. Before entering the job site, field workers need to receive training that includes information on *Phytophthora* pathogens and how to prevent the spread of these and other soilborne organisms by following approved phytosanitary procedures. Workers should also be informed about any site-specific phytosanitary practices before work commences.

- 3.1.2. Do not bring more vehicles into the planting area than necessary and keep vehicles on surfaced or graveled roads whenever possible to minimize potential for soil movement.
- 3.1.3. Travel off roads or on unsurfaced roads should be avoided when soil and road surfaces are wet enough that soil will stick to vehicle tires and undercarriages.
- 3.1.4. To allow for adequate decontamination of equipment, tools, gloves, and shoes, avoid planting under overly wet conditions or when soil is saturated.

3.2. Minimize unnecessary movement of soil and plant material within the planting area, especially from higher to lower risk areas

- 3.2.1 Brush off soil from tools and gloves when moving between successive planting sites to prevent repeated collection and deposition of soil across multiple sites.
- 3.2.2. Avoid contaminating clothing with soil during planting operations. Brush off soil accumulations before moving from one planting site to the next. Use nonporous knee pads that are cleaned between planting sites if kneeling is necessary.
- 3.2.3 When possible, plant nursery stock from a given block in the same local area rather than spreading it widely. If a problem is associated with a given block of plants, it will be easier to detect and deal with it if the plants are spatially grouped.
- 3.2.4. Phase work to minimize movement between areas with high and low risk of contamination. Where possible, complete work in low risk areas before moving to higher risk areas. Alternatively, assign personnel to working in either high or low risk areas exclusively to reduce the need for decontamination.
- 3.2.5. Clean soil and plant debris from large equipment and sanitize hand tools, buckets, gloves, and footwear when moving from higher risk to lower risk areas or when moving between widely separated portions of the planting area.
- 3.2.6. All non-plant materials to be installed at the site (irrigation equipment, erosion control fabric, fencing, etc.) shall be handled to prevent movement of soil within the site, especially movement from higher risk to lower risk areas. Materials should be kept free of soil contamination by maintaining them in clean vehicles or carts, trailers, etc., or stockpiling in elevated dry areas on clean tarps until used.

4. Clean water specifications

Objective: use only uncontaminated, appropriately-treated water for irrigation.

- 4.1.1. Water used for irrigating plants needs to be uncontaminated. See Appendix for specifications.

Appendix

A. Procedures for sanitizing tools, surfaces, and footwear

Surfaces and tools should be clean and sanitized before use. Tools and working surfaces (e.g., plant carts) should be smooth and nonporous to facilitate cleaning and sanitation. Wood handles on tools should be sealed with a waterproof coating to make them easier to sanitize.

Before sanitizing items, remove all soil and organic material (roots, sap, etc.) from their surfaces. If necessary, use a detergent solution and brush to scrub off surface contaminants. The sanitizing agent may also be used as a cleaning solution. Screwdrivers or similar implements may be needed to clean soil out of crevices or shoe treads. Brushes and other implements used to help remove soil must be visibly clean and sanitized after use.

After surface soil and contamination are removed, treat the surface with one of the following sanitizing agents, allowing the appropriate contact time before rinsing. If surfaces are clean and dry, wet surfaces thoroughly and allow for the appropriate contact time listed. If the sanitizer has been used to help clean the surface, use fresh sanitizer to rinse off any dirty solution and then allow the required contact time. If treated surfaces are wetted with water, the sanitizing solution will become diluted. Apply enough sanitizer to completely displace the water film and then allow the required contact time. Sanitizing agents may be applied with spray bottles to thoroughly wet the surface. Observe all appropriate safety precautions to prevent contact with eyes or skin when using these solutions.

- 70-90% ethyl or isopropyl alcohol - spray to thoroughly wet the surface and allow to air dry before use
- freshly diluted bleach solution (0.525% sodium hypochlorite, Table 1) for a minimum of 1 minute (due to corrosivity, not advised for steel or other materials damaged by bleach)
- quaternary ammonium disinfectant - use according to manufacturer recommendations, making sure that the label indicates that the product is suitable for your use situation and has activity against *Phytophthora* when used as directed. Solution should be freshly made or tested to ensure target concentration.

Table 1. Dilutions of commonly available bleach products needed to obtain approximately 0.525% sodium hypochlorite concentrations (5000 ppm available chlorine).

Percent sodium hypochlorite in bleach	Parts bleach	Parts water	Diluted bleach percent sodium hypochlorite
5.25%	1	9	0.525%
6.0%	1	10.4	0.526%
8.25%	1	14.6	0.529%
8.3%	1	14.8	0.525%

For example, adding 100 ml of 5.25% bleach to 900 ml of water will make 1000 ml of 0.525% NaOCl solution. If using 8.3% bleach, add 100 ml of bleach to 1480 ml of water to make 1580 ml of 0.525% NaOCl.

B. Clean water specifications

Surface waters, including untreated water from streams or ponds and nursery runoff, can be sources of *Phytophthora* contamination. Only uncontaminated water or water that has been effectively treated to remove or kill *Phytophthora* should be used for rinsing or irrigating plant material.

5.1. Water used for irrigation shall be from treated municipal water supplies or wells and delivered through intact pipes with backflow prevention devices. Tertiary-treated municipal recycled water is acceptable.

- 5.2. If well water is used, wellheads shall be protected from contamination by surface water sources.
- 5.3. Untreated surface waters and recycled nursery runoff shall not be used, and plants shall not be held where potential contamination from such sources is possible via splash, runoff, or inundation.
- 5.4. Irrigation equipment must be kept free of contamination that could be transferred to irrigation water or plants. All hoses, wands, and nozzles, and hand irrigation equipment must either be new or sanitized before use. Drip irrigation and other sprinkler parts should be new or sanitized. Hose ends, wands, or nozzles that become contaminated with soil or mud during use should be cleaned and sanitized before being used further.